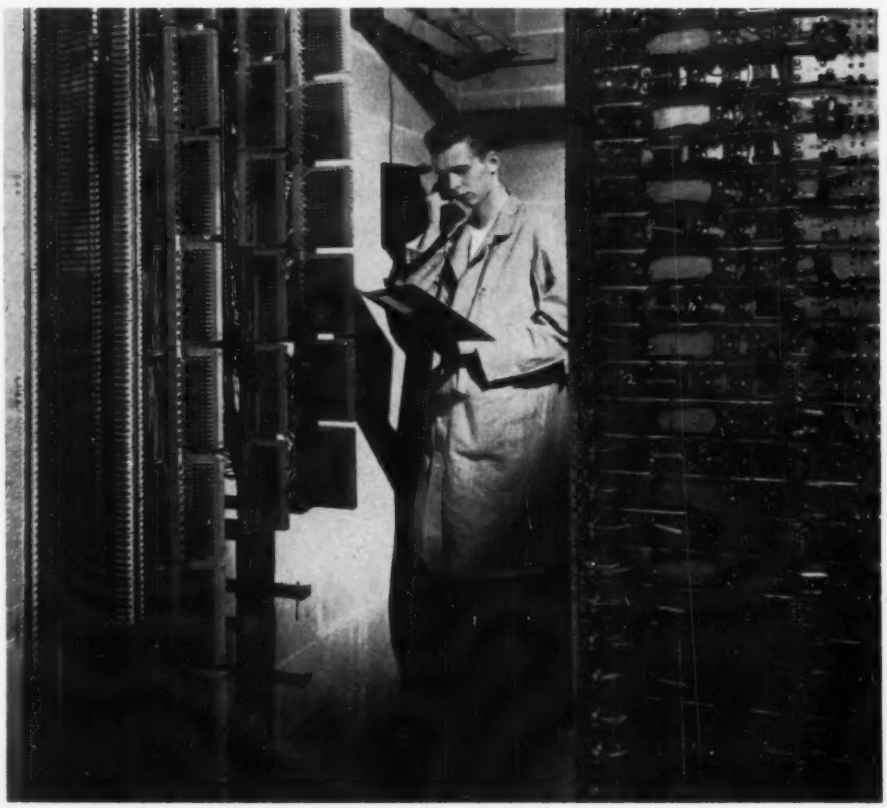
OCTOBER 25, 1958
VOL. 155 — NO. 17

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



INDUSTRIAL SUB-STATION

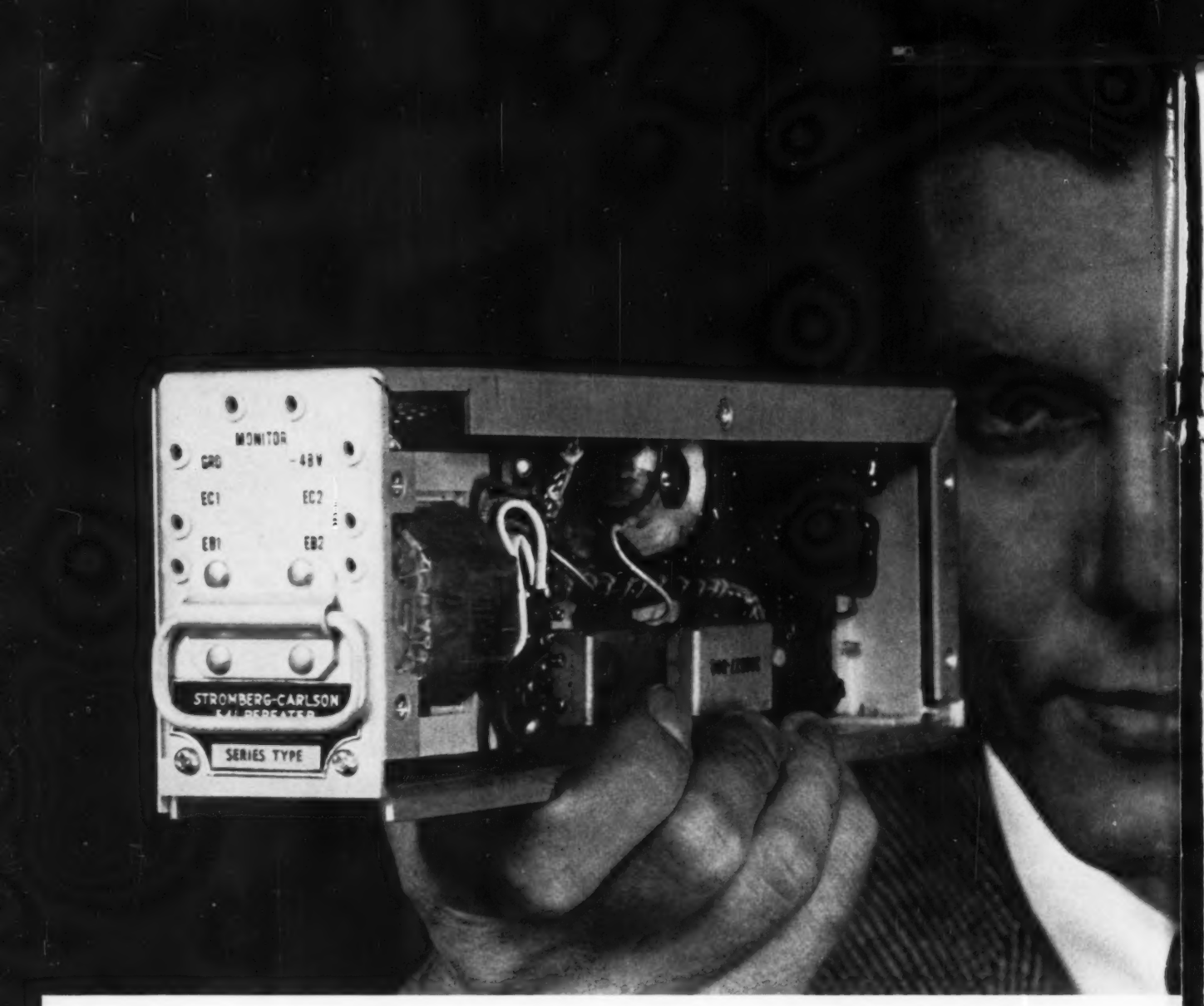
Skokie, Ill. warehouse of Rolled Steel Corp., selected by Illinois Bell Telephone Co. as site for sub-station to serve 24-acre industrial area. Fifty of 75 lines now operating are used by Rolled Steel's' 18-man sales staff, which sells exclusively by telephone.

Published every week on Saturday by TELEPHONY PUBLISHING CORP. 608 S. Dearborn St., Chicago 5, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

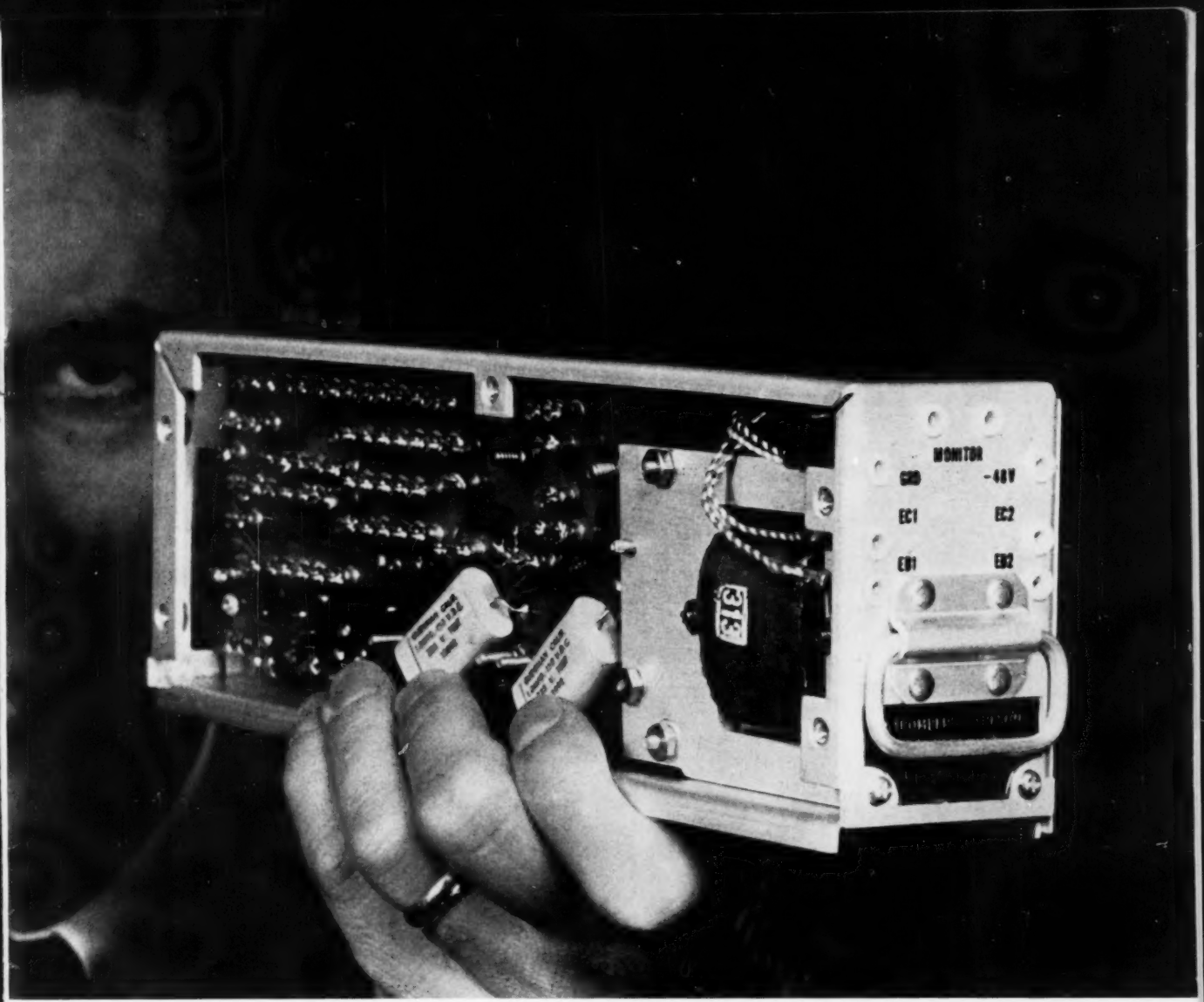
Guaranteed Circulation This Issue
12,991 of Which 12,416 Is Paid

USITA CONVENTION REPORT ISSUE

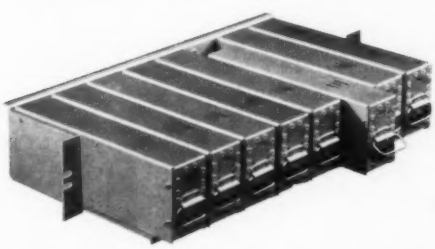
MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING



● 100% TRANSISTORIZED...You get years of service without replacement with Stromberg-Carlson's completely transistorized "541" negative impedance voice repeaters. You save space, too: a 19-inch shelf holds 8 repeaters, using only 3 1/2 inches of vertical rack space. Power drain is the lowest -- less than 1 watt per repeater



from existing 48-volt battery. Cable loading can be reduced; you use smaller gauge cable to meet today's transmission standards. "541" repeaters come in series and shunt types. Ask for full details.



STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ATLANTA: TRinity 5-7467 • CHICAGO: STate 2-4235 • KANSAS CITY: HArrison 1-6618
ROCHESTER: HUbbard 2-2200 • SAN FRANCISCO: OXford 7-3630

S-C STROMBERG-CARLSON | GD GENERAL DYNAMICS

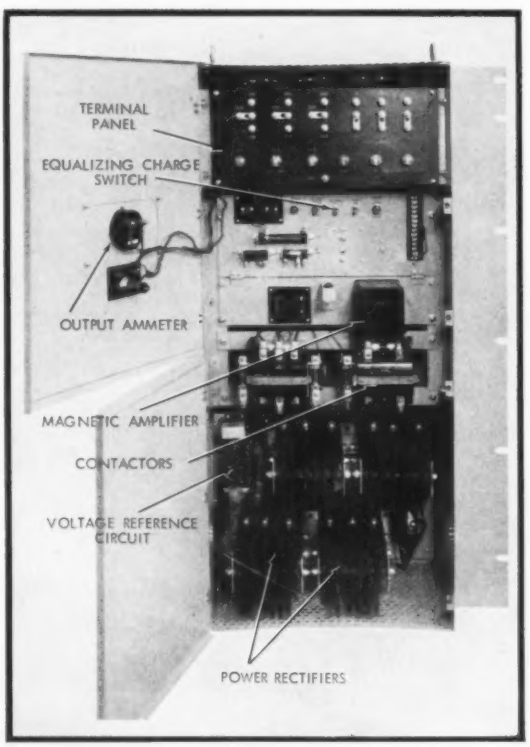
in the power field....

NEWS ABOUT RAYTHEON DEVELOPMENTS

HOW TO REDUCE YOUR TOTAL POWER SYSTEM COSTS

With Raytheon 48-volt Rectichargers you can extend the life of your storage batteries and cut maintenance and operating costs . . . facts below

BATTERY MAINTENANCE AND REPLACEMENT. Close regulation of "float voltage", adjustable from 2.13 to 2.18 volts per cell with batteries of 23 to 26 cells, prevents gassing, loss of water and sulfation caused by over and undercharging.



Line voltage changes of ±10% from no load to full load are controlled within ±1%. Life of batteries maintained on "float voltage" at their proper cell rating may exceed 18 years.

POWER SUPPLY OPERATION AND MAINTENANCE. Automatic, completely static charger, with conservatively rated components, is self-protecting and needs no periodic maintenance. Recommended annual inspection is all that is required.

No manual adjustments needed to correct for the effects of rectifier aging. Magnetic amplifier automatically compensates for output variations resulting from changes in circuit characteristics.

SYSTEM PERFORMANCE AND MAINTENANCE. Charger performs at higher efficiency in the normal operating loads of your switchboard, resulting in significant savings in power costs.

Built-in overload protection automatically limits available current when load increases beyond 125% of charger rating. This safeguards Rectichargers and other exchange equipment.

In case of line power failure, a relay in the charger input opens the output circuit and prevents battery discharge back into the AC supply.

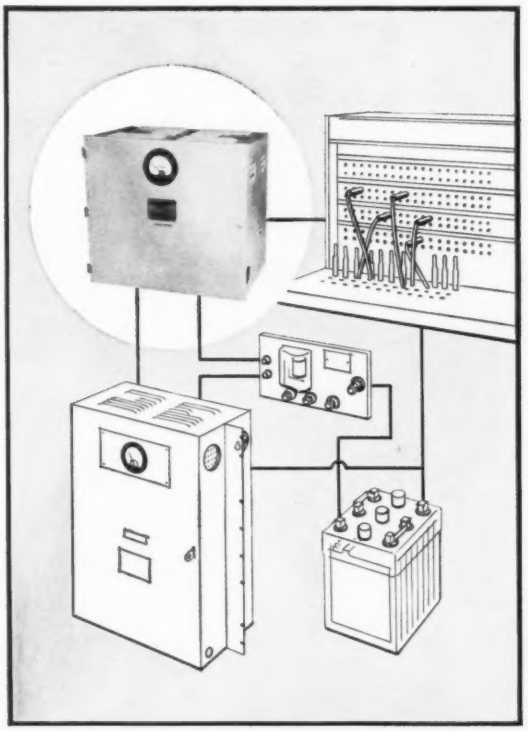
RAYTHEON MANUFACTURING COMPANY
WALTHAM, MASSACHUSETTS

....with Raytheon

IN TELEPHONE POWER SUPPLIES

RAYTHEON

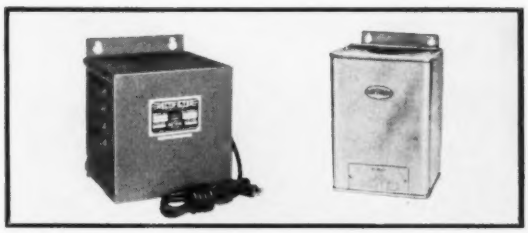
A SPECIAL EDITION



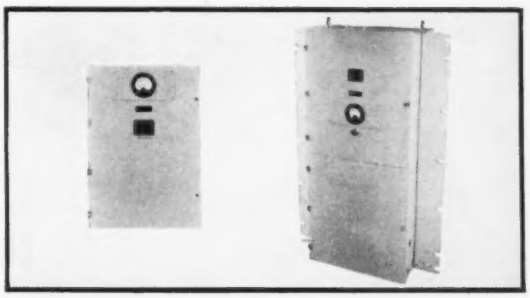
AN EFFICIENT WAY TO EXPAND CAPACITY OF THE RECTICHARGER

Economical too! With the help of a Raytheon Auxiliary Charger, an existing installation handles the additional load during the peak demand periods and takes care of "borderline loading" -- too high for the Recticharger but too low to warrant the purchase of a higher capacity charger. System diagram above shows interconnection of Auxiliary Charger, Recticharger, control relay and load. Auxiliary charger is cut in and out of circuit depending on load condition.

COMPLETE LINE ASSURES YOU OF THE RIGHT EQUIPMENT. Raytheon's line of telephone power supply equipment includes battery eliminators and Rectiringers (battery eliminators with 20 cycle ringing power), both shown below.



48-volt Rectichargers range from 3 to 400 amps in single and three phase models. Two typical models are shown below -- panel at left, rack-mounted at right.



TAKE ADVANTAGE OF RAYTHEON'S NATIONWIDE SALES AND SERVICE FACILITIES. Ask your Raytheon distributor about the special field assistance available to you.

For further facts, please write directly to Raytheon Manufacturing Company, Magnetic Components Department, Commercial Equipment Division, Waltham 54, Mass.

RECTIRINGERS • AUXILIARY CHARGERS • ALL POWER SUPPLY ACCESSORIES

NORTH HANDS PUT MORE "SERVE" IN YOUR TELEPHONE SERVICE

In your exchange, the "service" is the switching equipment.
North By-Path Crossbar switching equipment is the finest in the world—no other system has all the features engineered into North By-Path Crossbar!
North By-Path Crossbar puts more "serve" into your telephone service than any other switching equipment!
To the subscriber, the Ericofon is the personification of service.
The Ericofon is the most modern, beautiful, convenient and most wanted telephone instrument in the world!
Now, with the first transistorized electronic tone signal in the world the Ericofon is the only instrument as modern as the service it represents!
All North equipment is engineered and built to put real "serve" into your telephone service.
Behind every piece of North equipment lies the background and experience of 75 years—75 years of leadership that have developed North into

the dynamic force in the telephone industry

NORTH ELECTRIC COMPANY

NORTH

GALION, OHIO

FLASHES AND PLUGS

A SLIGHT REVERSAL. A not-so-bright young man bought a book describing inexpensive, fabricated houses and became so fascinated with the subject that he drew his last penny out of the bank and ordered a house by mail.

Some weeks later he telephoned to protest to the manufacturer: his house was a complete failure.

An inspector came to investigate and seeing the structure roared, "You've put up the whole thing upside down!"

"Oh, that's the trouble, is it?" pondered the befuddled customer. "No wonder I kept falling off the porch."

•

FORTY WINKS. It is a legend on Broadway that Playwrite Moss Hart can function on little or no sleep. One Tuesday in London, wearied by his rounds of the night spots, Mr. Hart went to bed at 9 p.m. hoping to get a good twelve hours of shuteye.

As George Kaufman tells the story, Mr. Hart awoke enormously refreshed, saw it was 9:30 by his watch, and that the fog outside was still a dismally thick blanket covering the sun. He bathed and shaved, whistling like a lark, and then ordered up a full breakfast of eggs, toast, coffee, and marmalade.

By the time he'd stowed them away, he was bursting with vigor. "Nothing like a good night's sleep," he told himself. "I must do this more often."

It nettled him a little, though, to find they'd sent him yesterday's newspaper. He telephoned down to complain.

"But that is this morning's newspaper, sir," the operator said.

A horrible suspicion overtook Moss. "What time is it?" he asked.

"Ten o'clock, sir."
"Ten o'clock when?"
"Ten o'clock Tuesday evening, sir."

He had slept exactly half an hour. Without more ado, he donned white tie and tails, and hurried to the Savoy and Quaglione's.

•

BOOTH SUITS BOTH SEXES. The new telephone booths in London, England, are to be painted in various "tender" colors and will be occasionally perfumed for the benefit of feminine callers, a recent report states.

The booths will also be subjected to "violence tests" to prove their strength. It seems that even Englishmen can sometimes forget their restraint and react violently when they have trouble getting a number or are cut off in mid-conversation.

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

October 25, 1958

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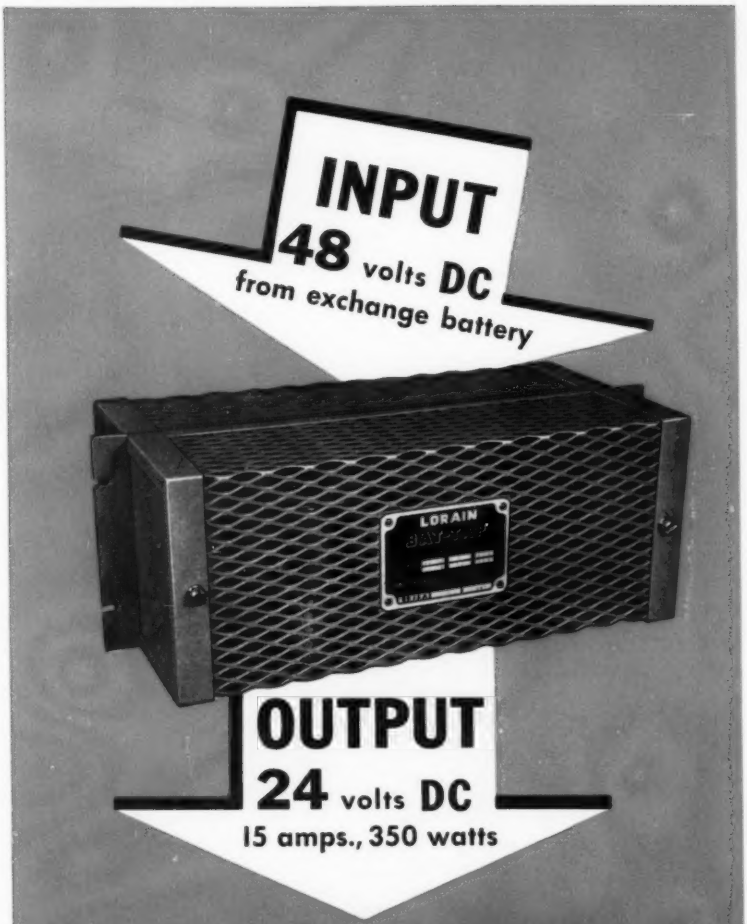


THE *New* LORAIN BAT-TAP

another FIRST from LORAIN!

the only device delivering 24 volts DC

with full efficiency, full battery protection

NO POWER LOSS

Voltage reduction by CEMF cells or resistors wastes half the power used. Bat-Tap prevents this loss.

PROTECTS BATTERY

Voltage reduction by tapping the battery causes uneven charging and discharging of cells, unless an extra 24-volt charger is used on the cells involved. Bat-Tap protects your battery, needs no extra equipment.

NO MOVING PARTS

The Lorain Bat-Tap uses a new transistorized inductor arrangement combined with silicon diodes. 48-volt DC is first converted to AC, then to 24-volt DC in a simple, foolproof circuit.

SAFE ON OVERLOADS

Bat-Tap easily withstands intermittent overloads up to 30%.

FULL EFFICIENCY

Efficiencies are as high as 80 to 89% from 25% of rating to 30% overload. Efficiency at full load is 87.5%.

RATINGS

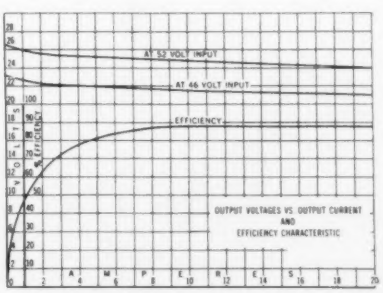
Model QB15A

Input: 44-52 volts, 0.5 ampere no load, 8 amperes 400 watts full load.

Output: 21-27 volts at full load of 15 amperes, 350 watts.

Regulation: 1.5 volt drop from 1 ampere to 15-ampere load.

Filtered input and output (output filtered to 2 millivolts).



EASY INSTALLATION

Bat-Tap requires only simple external connection of input and output leads. Fits 19″ relay rack. Height 6¾″. Depth 9¾″. Weight 32 lbs.

ZERO MAINTENANCE

The Lorain Bat-Tap never needs attention. There is nothing to wear out or need adjustment. Install it and you can forget about your 24-volt power supply.

POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

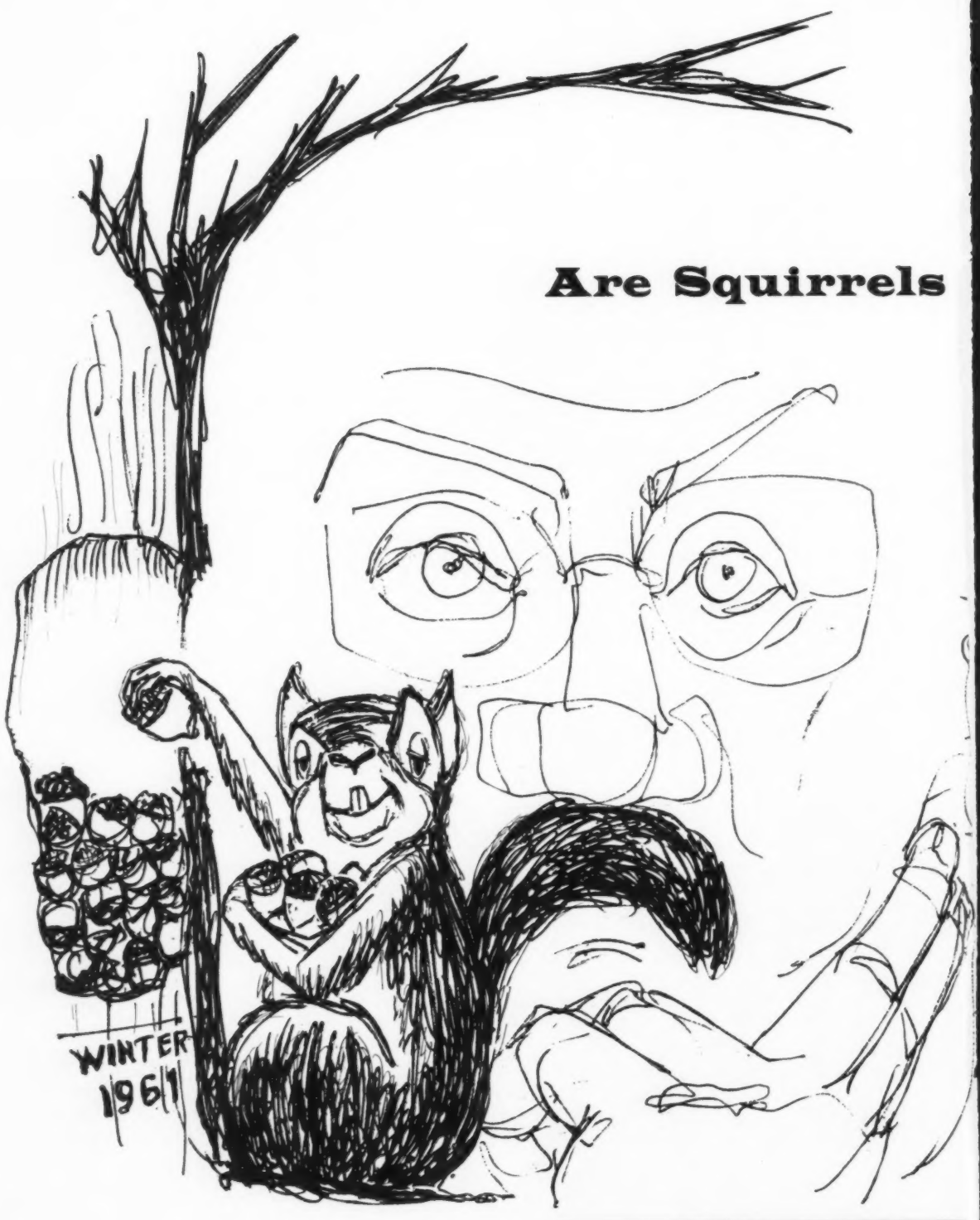
our equipment is sold through leading telephone distributors

FLOTROL SUB-CYCLE

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

Are Squirrels



LEICH

Subsidiary of GENERAL TELEPHONE

Really Smarter Than People...?

No doubt all of us have run into some bumptious, eat-drink-and-be-merry characters who strike us as being one stage below the rascally squirrel in their planning for the future.

Right here and now you may quote us as saying that telephone people are smarter than any forest full of squirrels ever will be. In fact, their job of planning for next year . . . for the next five years . . . for the next 10 years . . . is probably one of the toughest forecasting jobs that any business has to face.

Who would know that a motel would triple in size, or that a cable lead which was considered adequate for 5 years would be completely loaded in two? Or that farmer Johnson's cornfield would become a bustling village?

That's why we, here at Leich, suggest and offer equipment and supplies for whatever expansion may come.

Sometimes—in our effort to be of genuine service—we might even lose an order by suggesting that you buy more equipment than you need right now. This is our responsibility and we know many telephone companies appreciate this service.

If we sound like the company you would like to do business with, we're glad. Give us a call.

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.
SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

manufacturers of telephones, switchboards and related apparatus since 1907

AUTOMATIC RECORDER-ANNOUNCERS

Choose from 5 models—to save money—to make money!

TIME ANNOUNCER automatically broadcasts the correct time every 15 seconds with a message between announcements. Some telephone companies use the "between" time for giving public service messages. Others sell it for sponsored commercial messages. Any way you use it, the Automatic Time Announcer is a revenue-builder for you!

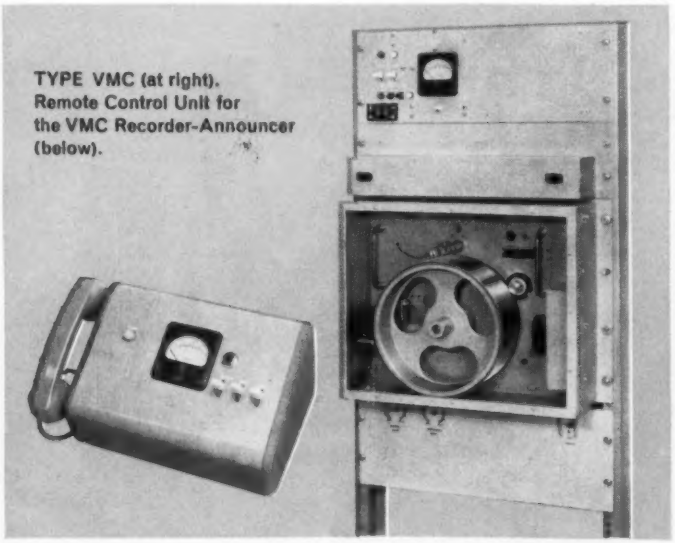
With a Recorder-Announcer, you make intercept announcements and give public service messages, *automatically!* You save on labor costs because operators are relieved for other duties. And, you can make an announcer pay for itself quickly by selling advertising time to sponsors. Automatic Recorder-Announcers save money, and make money for you.

Automatic Electric offers a complete line of Recorder-Announcers for giving any type of message. These precision-engineered machines use magnetic recorders for lifelike reproduction. Messages are free from annoying breaks or changes of pitch. Current consumption is low, even when an announcer is run continuously.

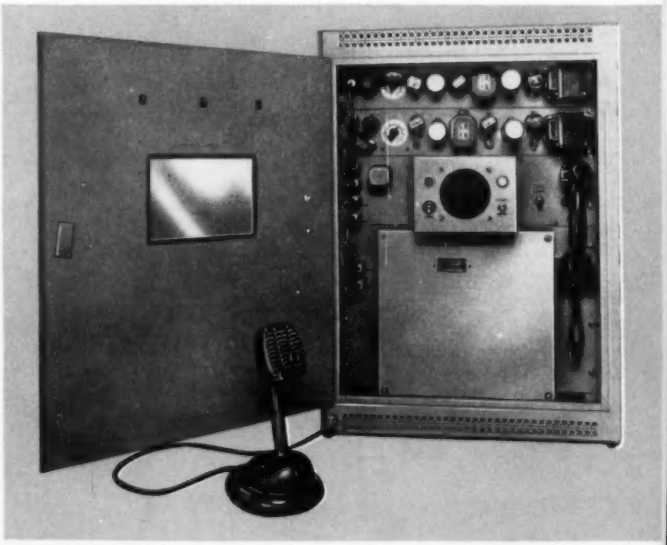
One or more of the announcers shown here would be ideal for your exchange. For further details, write: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call, Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto, 16.*

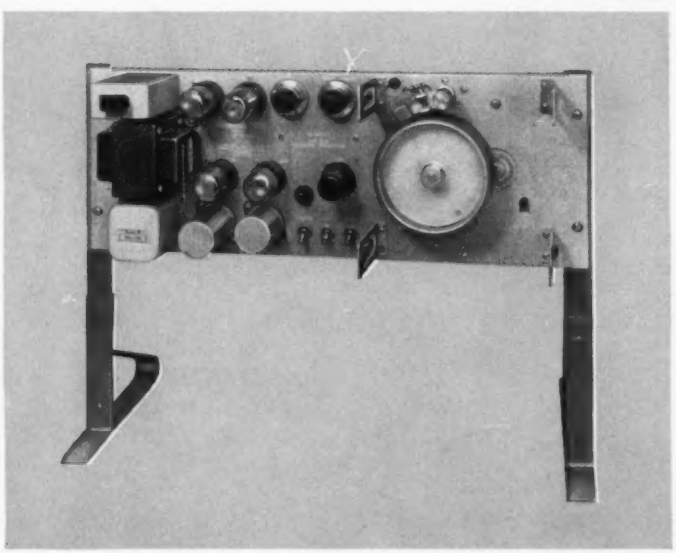
TYPE VMC gives any message up to four minutes long: weather forecasts, paid commercials, public service messages or a combination of any of these. Anyone can record the announcement from anywhere (even from another city by remote control). Old message erased and a new one recorded in one step.

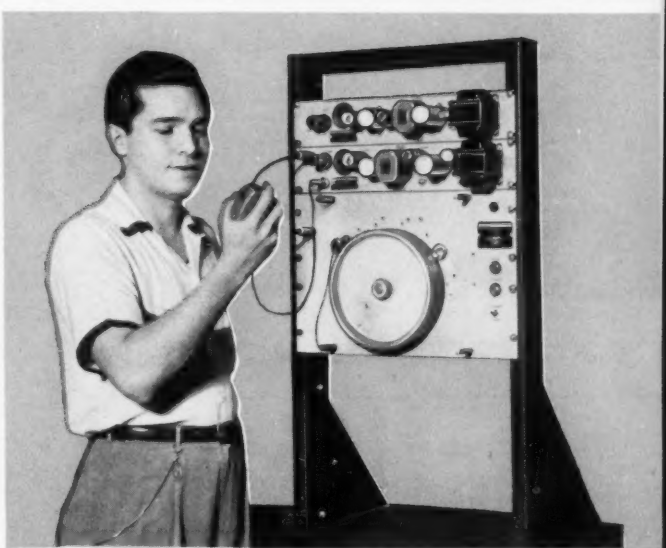
TYPE FML is designed to give a single message (either 6½ or 12 seconds long). Telephone companies use this machine to inform volunteer firemen of the location of a fire. You might also find it useful for announcing theater and train schedules. And, there are a dozen other uses for this Recorder-Announcer.



TYPE VMC (at right). Remote Control Unit for the VMC Recorder-Announcer (below).







TYPE SCC This compact, low-cost announcer gives any message, 12 seconds long. Ideal for intercept service when only one announcement is needed (or, you can profitably use two SCC machines for two different messages). Can also be used for giving commercial announcements.

TYPE MCF is used for repetitive services such as interception of calls to disconnected lines, dead levels, etc. Provides up to five separate messages. Initially, you buy equipment for only the number of channels you need. Other channels can be added at any time.

AUTOMATIC ELECTRIC

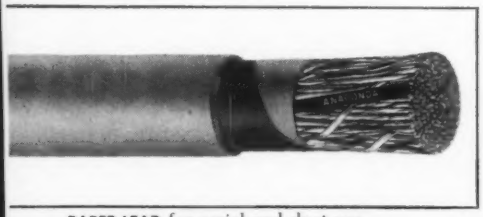
Subsidiary of GENERAL TELEPHONE

See the Man from Anaconda for

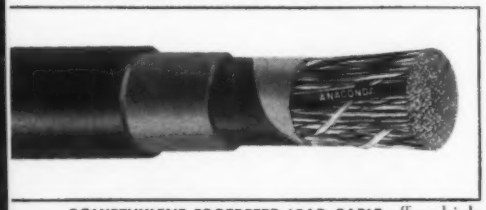
Paper-lead Telephone

in the type and size you need . . .

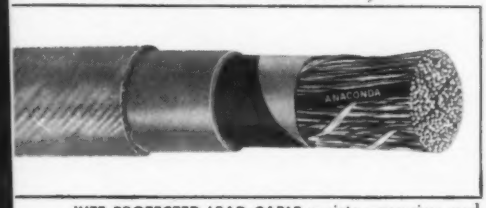
Choose Anaconda Paper-lead Telephone Cable in the type you need.



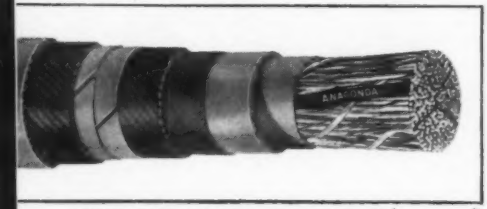
PAPER-LEAD for aerial and duct use.



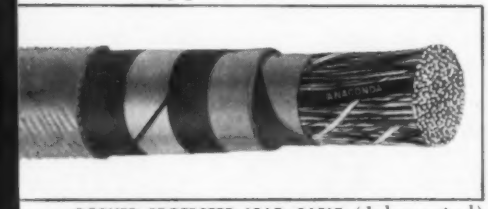
POLYETHYLENE PROTECTED LEAD CABLE offers high resistance to corrosion and electrolysis.



JUTE PROTECTED LEAD CABLE resists corrosion and electrolysis.



BURIED TAPE ARMORED LEAD CABLE (2 layer steel) for areas subjected to low-frequency induction from nearby power lines.



GOPHER PROTECTED LEAD CABLE (1 layer steel) direct burial cable where mechanical protection is needed.

ANACONDA PAPER-LEAD TELEPHONE CABLE being installed near Harold, Kentucky.

Cable from 6 to 2121 pairs—

. . . when and where you need it!

Anaconda offers you everything you need in paper-lead telephone cable—produced in a new, modern plant devoted exclusively to telephone cable products. Telephone experienced personnel who understand your problems utilize the latest, most exacting quality control standards—to produce quality telephone cable. And order service is prompt and efficient wherever you are because of a national network of distributors, Anaconda sales offices, and mills.

Call your Anaconda distributor or the Man from Anaconda for your paper-lead telephone cable needs. Also—write for new Catalog DM-5771. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

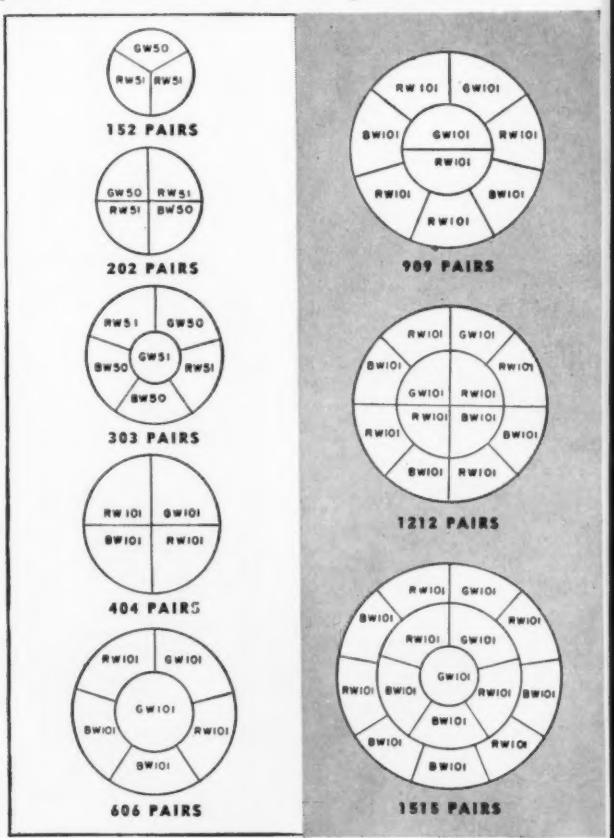
58324

Shown here is a typical unit construction for 152 pairs through 1515 pairs, No. 24 Awg. Following constructions also available:

No. 19 Awg	6 through	455	pairs
No. 22 Awg	11 "	909	"
No. 24 Awg	11 "	1515	"
No. 26 Awg	11 "	2121	"

The number in the assemblies denotes the number of pairs in the unit. The letters refer to the color of the outside pairs of the unit. GW, green-white; RW, red-white; BW, blue-white. The units are further distinguished by a color-coded binder string.

Choose Anaconda Paper-lead Telephone Cable in the size you need.



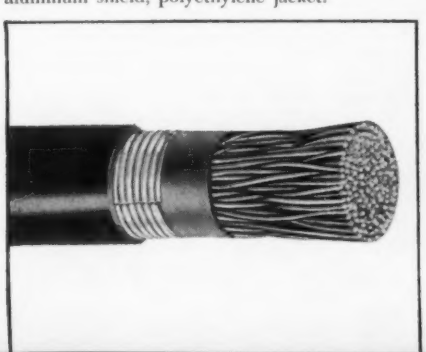
UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

PHONE THE MAN FROM ANACONDA®

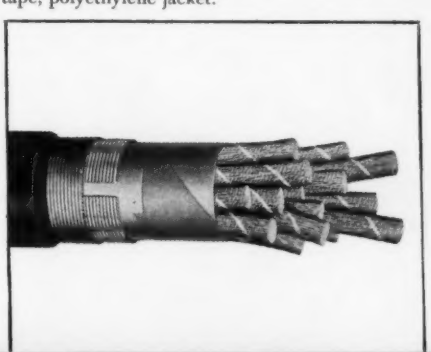
The Independent Manufacturer to the Independent Telephone Industry

FOR TELEPHONE CABLE

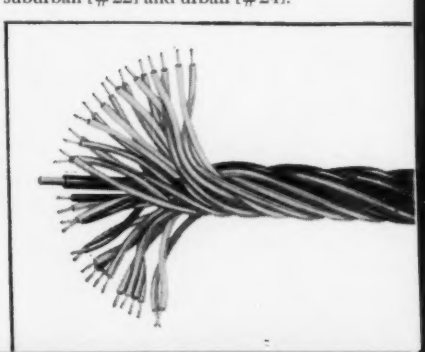
ALPETH—Polyethylene-insulated, low-resistance aluminum shield, polyethylene jacket.



STALPETH—Paper-insulated, aluminum shield, steel tape, polyethylene jacket.



DISTRIBUTION WIRE—rural [#19], suburban [#22] and urban [#24].



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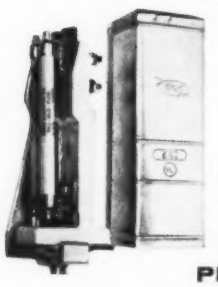

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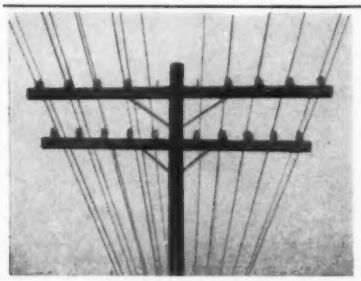

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This ad should prompt many people to call their local business offices for a bedroom phone.

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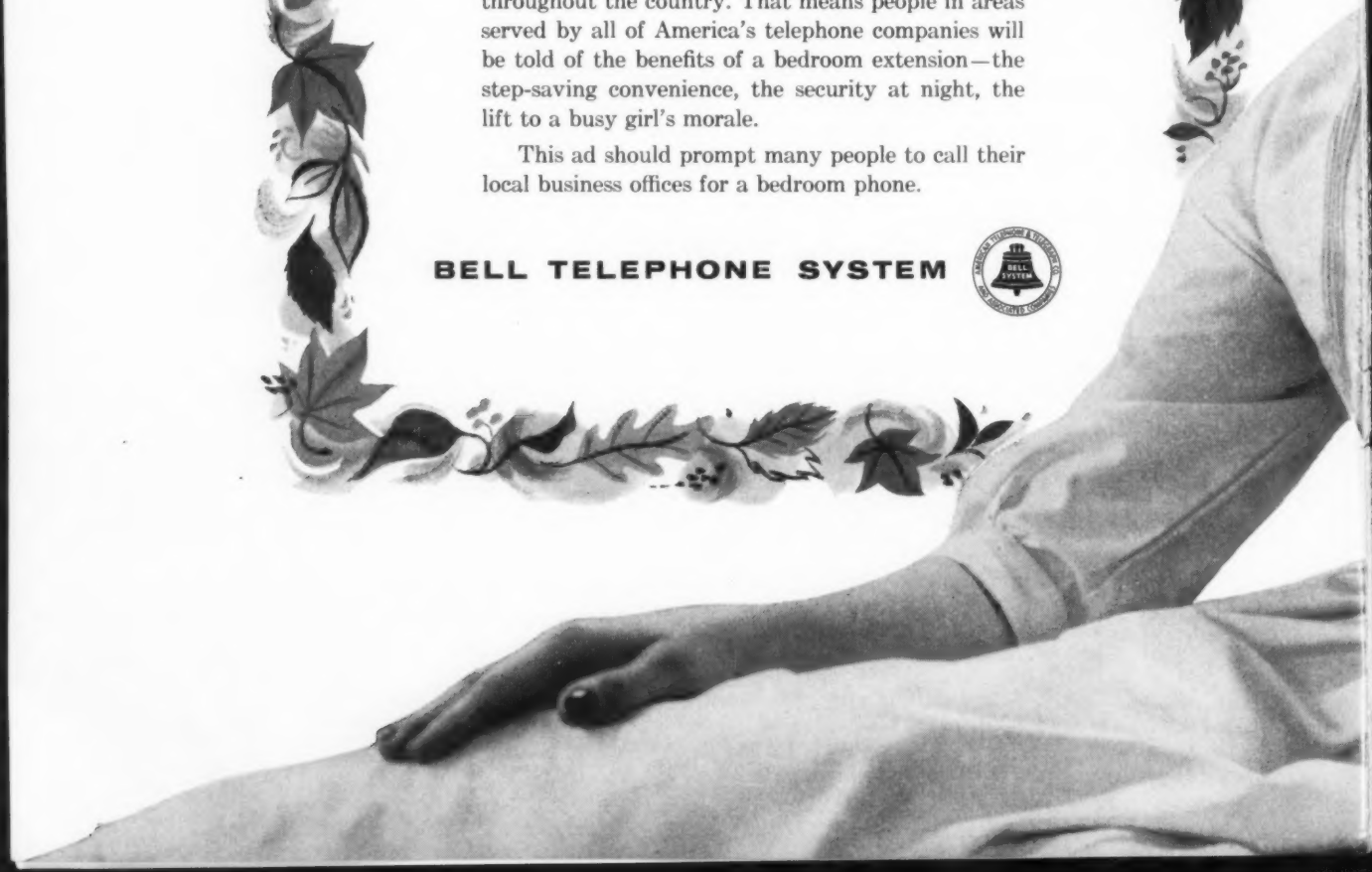

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SYcamore 4-2441
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ILLINOIS
4600 So. Tripp Ave.
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CLiffside 4-4300
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KANSAS
7th & Sunshine Road
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MAyfair 1-4418
TWX KC KAN 1055

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West 9-6715
TWX MP 1195

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PRescott 9-3610
TWX PAS 1067

OHIO
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EDITORIAL

Our Future Service Responsibilities

(Third of a series of four editorials addressed to the telephone industry-at-large)

LAST AUGUST Congress passed, and the President signed, a so-called "rail aid" bill. It was designed to bail the nation's railroads out of serious financial difficulties in which they now find themselves, due to adverse economic developments over the years. These include unfair competition and over-regulation.

The new law gives federal backing for new equipment loans, some tax relief, and other much needed assistance to the railroads. But, there is widespread fear that all this may be too little and too late. And, there is the growing realization that more and more *federal control* must inevitably follow more and more *federal financial aid.* So, it is possible that the American railroads may yet slip into the morass of public ownership by default.

How did the railroads get into such a shape? Railroad men, themselves, are very frank. Some of their troubles were of the kind which nobody could help, such as the coming of the private automobile and motor truck and, more recently, the airlines. But, there were other things which might have been helped with foresight. Forty years ago the railroads were secure as a profitable national industry. Their stocks and bonds were among the bluest of the blue chips. And, the regularity of dividend payments by such lines as the New York Central and the Pennsylvania compared favorably with the performance of prime telephone securities today. Does the mere invention of such a parallel suggest anything?

It was about that time that the railroads—as a railroad industry man once said during a congressional committee hearing—went into a "Rip Van Winkle act." The threat of competition from automobiles, buses, and trucks was not taken too seriously. It was pointed out, at that time, that there were relatively few miles of good highways on which these newfangled horseless carriages could even operate. And, so, instead of marking out and insisting on their own participation in the newer forms of common carrier transportation, the railroads—under Interstate Commerce Commission domination and restrictive federal statutes—were confined to conventional track and roadbed operations. What has developed since then is too well known to repeat.

It is a fair question to ask whether the telephone industry may not be today at just such a crossroad in the historical development of public communications service. Nobody, today, disputes the right of telephone companies to be in the strictly conventional telephone business. But, there are a lot of people disputing the right of telephone companies to engage in the newly developing forms of radio and other electronic-type communications—*even on a common carrier basis!*

There is a real danger, here, that new and different forms of industry can be established which will eventually throw telephone companies out of the profitable end of much public communications business in years to come. The situation demands both vigilance and discipline within the telephone industry, along with a community of purpose which matches its obvious community of interest.

All of us have seen—many with our own eyes—how the telephone business has grown and greatly changed in character since the days of Alexander Graham Bell. Years ago, the telephone industry's goal was one telephone for every home. That was at a time when some companies were lucky to have a half-dozen telephones in a single city block. Today, the telephone industry's merchandising objective is more likely to be in the order of one telephone for every major room in every house in America, and two or more subscriptions for every family-sized home or place of business.

But, the time is not too far off when the industry must again raise its sights—when we will be talking about *one telephone for every automobile or even every person!* This means that the telephone industry will be going "off the wires" more and more, and into the realm of radio-telephony. This means that the industry must stake out its own preserves or be left behind in the race. Its public responsibilities are growing.

Civilization is fast moving into an era of greater dependence on new and faster forms of communications. We have seen how the era of steam and electrical development has freed mankind from much of the back-breaking burdens of *physical* toil, and has created a society of high living standards based on dynamic mechanical production. Now, the era of electronic and radio development promises to free man's *mind* from such mental burdens as recording, computation, and other tedious routines, thereby giving him more leisure and better equipping him to cope with the ultimate challenge of space conquest.

For the telephone business there beckons a future of multiple new tasks in the realm of strictly public service communications. Already, automatic switching equipment has assumed the complexity and subtlety of large-scale computers. The advent of electronic switching has opened up such new possibilities as push-button dialing, centralized answering and recording services, and other special business services and operational improvements. Already, radio-telephony points to individual telephone paging service. The time approaches when two-way telephone communications between the home, the office, the shop, the plane, the train, and the auto will become commonplace.

Already on the horizon are tremendous increases in the carrying capacity of telephone facilities which will come with the use of pulse modulation, wave guides, and other things now in the laboratory or engineering stage. We may logically expect that the telephone industry in the future will be carrying great *masses* of routine information —the "freight" of communications, so to speak—just as the railroads now carry the masses of physical freight transportation. Whole books and volumes of pictures, inventories, and case histories, in greatest detail, will be flashed around the world in a matter of minutes. Isn't it clear that those to whom will be given the great responsibility for handling such business will be in the very center of things to come? This is not foreign to the present character of telephone service—it is simply a logical evolution. The industry would be blind, indeed, if it did not follow up, aggressively, its manifest destiny as an indispensable public servant.

To cash in on this, the industry must get away from the traditional "pair-of-wires" concept of telephone service. We no longer have a telephone business based on fixed installations on subscribers' premises connected by a physical "pair-of-wires" with each other. The very continued use of the time-honored phrase "telephone station" could become a mental bloc, obstructing clear vision regarding the shape of things to come. This dynamic telephone business of ours is anything but stationary. And, there is a positive hazard in lazy thinking along outmoded lines.

All this is not to suggest that the small Independent telephone company of today must necessarily concern itself with such complex matters as wave guides and electrical pulses. But, even the small company must concern itself with its own proper part in the picture—its position as a cog in the industrial machinery as-a-whole. The Bell System and the larger Independents have their work cut out for them, blazing the trails and securing the right-of-way, so to speak, for these new communication highways of the future. The role of the smaller Independent companies will be unfolded in due time. And, it will be an important and profitable role if proper planning and coordinating steps are taken now. But, both branches of the industry—Bell and Independent—*must* function cooperatively, or this golden opportunity will be frittered away. Worse yet, it may be scattered among numerous outside rival business interests already clamoring to pick up the pieces.

To sum up, we must convince the public, the Federal Communications Commission, and Congress, if necessary, that this big and important job can be better done in the public interest by an experienced regulated communications industry than by an unregulated bunch of newcomers or business opportunists. But, we must first convince ourselves what the score is.

Before the telephone industry can even bid for general recognition and acceptance of these responsibilities by the FCC, or anybody else, there must be some fundamental agreement within the industry as to what these responsibilities are; or what they should eventually embrace. Telephone companies, large and small, cannot afford to go to sleep at this critical time.

NEXT—"Setting the Industry's Own House in Order."

USITA Convention Report

By R. C. Reno

ATTENDANCE at the 61st annual convention of the United States Independent Telephone Association—held Oct. 12, 13, 14 and 15 in Chicago—equalled the record established at the 1957 convention. As in previous years, representatives of Independent compaines from every state, U. S. possessions and territories, as well as from several foreign countries, attended the meeting.

Emphasis again was placed by convention speakers on the many new developments, equipment and techniques recently introduced in the telephone art, especially at the sectional conferences —Accounting, Commercial, Engineering, Plant and Traffic.

Discussions centered around such subjects as merchandising and selling, Direct Distance Dialing (DDD) and its effects on the different phases of telephone company operation, supplying circuits and other facilities for data transmission, mark-sensed toll tickets, application of electronic developments to telephony, and other new techniques.

The importance given to new equipment and developments was also emphasized in the displays of manufacturers and suppliers. The exhibits were "packed" all during the convention, which clearly indicated the interest in the new products by operating company personnel. The Independent industry, with its modernization programs and adoption of electronic equipment, is attracting the attention of many new suppliers as evidenced by the fact that at this year's USITA convention there were 93 exhibitors, compared with 84 in 1957 and only 50 in 1953—five years ago.

Also coming in for a big share of attention at the convention is the necessity for state regulatory commissions to recognize the need for higher rates and adequate earnings on the part of telephone companies if they are to continue to attract sufficient new capital to finance new and expanded plants to adequately serve their communities.

Telephone companies which have borrowed funds from the Rural Electrification Administration held a meeting on Oct. 12, prior to the general convention. The meeting, which is the first of its kind held at USITA conventions, was sponsored by the USITA REA Borrowers Committee, of which W. G. Winters of Houston, Tex., is chairman. Mr. Winters presided over the meeting.

The Independent Telephone Pioneer Association also held its annual meeting on Oct. 14. The principal items of business were reports by President Richard N. Cole of Marion, O., and Executive Secretary-Treasurer Mayme Workman and various committees.

The following Pioneer directors were elected: Douglas S. Guild of Honolulu, Hawaii; Berney Simner of St. Louis, Mo.; and Fred H. MacGougan of Monrovia, Cal. They succeeded Mr. Cole, R. J. Alter of Galesburg, Ill., and W. P. Strickenburg of Meadville, Pa.

The Pioneer directors elected the following officers: President, W. F. Miller of Des Moines, Ia.; vice presidents, E. M. Hiestand of Madison, Wis., and G. A. Hearne of Kansas City, Mo., and executive secretary-treasurer, Mrs. Workman.

Secretaries of state telephone associations and chairmen of USITA Regional Small Company Committees also held meetings during the convention.

Of interest to Independent telephone companies were two actions of the USITA board of directors.

The board voted to rescind a resolution which it had passed in March, 1958, directing the USITA to intervene in FCC cases having to do with acquisitions of Independent telephone properties by Bell companies.

The resolution, passed in March and rescinded at the convention meeting of the board, among other things, provided "that whenever there is an Independent telephone company, ready, able and willing to purchase Independent property and provide adequate service in the public interest, in instances in which the purchase price offering is approximately equivalent to the offering price by a Bell company, the USITA shall intervene in any proceeding before the Federal Communications Commission . . . and shall also confer with any other interested federal agency, in order to protect the proper interests of the Independent branch of the telephone industry."

In another action, the board of directors approved the continuation of the USITA national advertising program for next year, subject to consideration and action by the association's executive committee at its budget meeting, to be held later this year.

The board also presented retiring USITA president, Clive W. Haas of Big Timber, Mont., an inscribed gold watch in appreciation of his service and leadership as president during the past year.

H. A. BARNHART
President

F. B. McHENRY
First Vice President

C. C. PEARCE
Second Vice President

KELLEY McNISH
Third Vice President

Mr. Haas also was presented a plaque by the association at the last session of the convention, expressing the organization's appreciation for his service.

The following directors were re-elected by the convention: J. Ballard Atherton of Honolulu, Hawaii; E. G. Bellamy of Knoxville, Ia.; C. D. Brorein of Tampa, Fla.; H. E. Hageman of Lorain, O.; A. L. Hart of Kansas City, Mo., and C. C. Pearce of Riceville, Ia.

New directors elected were: E. C. Gates of Minneapolis, Minn.; R. F. Lucier of Warsaw, Ind.; P. A. Nenzel of San Francisco, Cal.; H. G. Payne of Export, Pa.; R. E. Rudolph of Ellensburg, Wash.; R. J. Schafer of Pinconning, Mich.; K. L. Schroeder of Freeport, Ill.; H. M. Stewart of Cornelia, Ga., and H. W. Vaughan of Fayette, Ala.

Other directors are H. G. Allen of Milton Junction, Wis.; F. S. Barnes of Rock Hill, S. C.; H. A. Barnhart of Rochester, Ind.; E. M. Blakeslee of Santa Monica, Cal.; H. R. Bollinger of Waconia, Minn.; T. A. Boyd of New York City; D. H. Campbell of Rochester, N. Y.; E. H. Danner of San Angelo, Tex.; L. D. Densmore of Lincoln, Neb.; R. J. Fegan of Junction City, Kan.; C. W. Haas of Big Timber, Mont.; M. M. Hale of Lincoln, Neb.; W. C. Henry of Bellevue, O.; L. W. Hill of Tarboro, N. C.; D. O. Hood of Medford, Ore.; F. G. LaPrade of Martinsville, Va.; R. A. Lumpkin of Mattoon, Ill.; F. B. McHenry of Jefferson City, Mo.; Kelley McNish of Bristol, Tenn.; A. J. Sordoni of Wilkes-Barre, Pa., and W. G. Winters of Houston, Tex.

The USITA directors elected the following officers; President, Mr. Barnhart; first vice president, Mr. McHenry;

C. S. BAILEY
Executive Vice President

C. D. BROREIN
Treasurer

G. C. RICHERT
Secretary

USITA Executive Committee

H. A. BARNHART, Rochester, Ind., Chairman
F. S. BARNES, Rock Hill, S. C.
C. D. BROREIN, Tampa, Fla.
R. J. FEGAN, Junction City, Kan.
MERLE M. HALE, Lincoln, Neb.
C. W. HAAS, Big Timber, Mont.
F. G. LaPRADE, Martinsville, Va.
R. A. LUMPKIN, Mattoon, Ill.
FOSTER B. McHENRY, Jefferson City, Mo.
C. C. PEARCE, Riceville, Ia.
A. J. SORDONI, Wilkes-Barre, Pa.

second vice president, Mr. Pearce, third vice president, Mr. McNish, executive vice president, Clyde S. Bailey of Washington, D. C.; treasurer, Mr. Brorein; secretary, George C. Richert of Washington, D. C., and assistant secretary, Courtney S. Snyder of Washington, D. C.

To provide a permanent record of the convention proceedings for those who did not get copies of addresses and for those unable to attend the convention, TELEPHONY, as it has done in past years, is publishing, on succeeding pages, addresses given at general sessions and conferences, with the exception of the reports of conference chairmen and addresses by Hanson Baldwin, military editor of the New York *Times*, and Dr. M. Graham Clark, president of The School of the Ozarks, Point Lookout, Mo.

The fact that the world, through communications, is shrinking, is one of the reasons behind the struggle for power between the United States and the U.S.S.R., Mr. Baldwin said in his speech, "Where Do We Go From Here?"

Pulitzer Prize winning Mr. Baldwin analyzed the world situation giving as other reasons for the conflict: (1) the fact that whenever there are two superstates like the United States and the U.S.S.R., history shows that a rivalry springs up between them; (2) the rise of nationalism; (3) anti-colonialism; (4) the creation of new states since World War II; (5) local and regional problems; (6) the spread of industrialization; (7) the technological revolution; (8) expanding population.

Considering all these sources of potential strife, how does the United States rate as a military power in relation to Russia? Mr. Baldwin believes that the United States is a stronger military power due mainly to its naval and nuclear superiority and also due to the fact that the U. S. has unrivalled industry and a superior air force. However, we do need more tactical nuclear weapons and anti-submarine and aircraft weapons. Also, Russia has a greater advantage in its land army, and Russia is getting stronger. However, Mr. Baldwin does not visualize a superior Russia by 1960-1966.

On the subject of the "Cold War," Mr. Baldwin lined up areas of the world, detailing our strengths and weaknesses in each.

He felt that Western Europe is the most important area to the United States and he listed as its bright spots, NATO, Western Germany, and the fact that France, under DeGaulle, seems to be headed for some renaissance. On the minus side, is Cyprus.

Turning to the Middle East, Mr. Baldwin said he felt that the United States' sending of troops to Lebanon was an error. We were not opposing communism in this action. The trouble there was caused by a Moslem-Christian civil war, and as a result of our intervention, Mr. Baldwin thinks a less friendly government in that country may emerge.

Problems in the Middle East, Mr. Baldwin said, are unsolvable in our lifetime. We should put first things first, he said, and not insist on pro-western governments everywhere or oppose Nasserism everywhere. The most we can ask for is neutralism with the important things being our continued access to oil and the prevention of communist domination.

Going on to the Far East and Asia, Mr. Baldwin gave the history behind Quemoy.

The world struggle for power is by no means over, Mr. Baldwin declared. However, there are cracks in Russia's armor and slowly seeds are sprouting. There is the struggle for power between Russian leaders; Titoism is springing up, as in Poland; vested interests want to keep the status quo and are contributing to the rise of classism, and mass education has created questioning. However, it is a slow process. What can we do about the world situation in the meantime?

All that is left for us, he felt, out of the alternatives of isolationism, stabilization by world order, war, and balance of power, is to keep a balance of power. This has been followed before and history shows it has made for periods of stability. The United States must continue to keep her military strength and her ability to fight any kind of war. The only course we can follow, he said, is collective security.

The telephone industry, both with respect to customers and to employes, is very dependent on public relations, Dr. Clark, in his talk, "Getting Along with People," emphasized. He outlined a technique for achieving better interpersonal relations:

(1) Realize your dependence on other people and the extent of this dependence. Our complete technology has made us interdependent both materially and psychologically.

(2) Be genuinely friendly without resorting to backslapping and false compliments.

(3) See whatever the difference may be from the other fellow's point of view. Many things depend on where you sit as to how you see them.

(4) Practice the tenets of your faith. Dr. Clark said that we must do more than profess our faith glibly on Sunday and cast it aside the rest of the week.

New USITA Officers

President
H. A. BARNHART, Rochester, Ind.

First Vice President
FOSTER B. McHENRY, Jefferson City, Mo.

Second Vice President
C. C. PEARCE, Riceville, Ia.

Third Vice President
KELLEY McNISH, Bristol, Tenn.

Executive Vice President
CLYDE S. BAILEY, Washington, D. C.

Treasurer
CARL D. BROREIN, Tampa, Fla.

Secretary
GEORGE C. RICHERT, Washington, D. C.

Assistant Secretary
COURTNEY S. SNYDER, Washington, D. C.

New USITA Directors

Re-elected

J. BALLARD ATHERTON, Honolulu, Hawaii
E. G. BELLAMY, Knoxville, Ia.
C. D. BROREIN, Tampa, Fla.
H. E. HAGEMAN, Lorain, O.
A. L. HART, Kansas City, Mo.
C. C. PEARCE, Riceville, Ia.

Elected

E. C. GATES, Minneapolis, Minn.
R. F. LUCIER, Warsaw, Ind.
P. A. NENZEL, San Francisco, Cal.
H. G. PAYNE, Export, Pa.
R. E. RUDOLPH, Ellensburg, Wash.
R. J. SCHAFER, Pinconning, Mich.
K. L. SCHROEDER, Freeport, Ill.
H. M. STEWART, Cornelia, Ga.
H. W. VAUGHAN, Fayette, Ala.

Independent Telephony Marches On

*By CLIVE W. HAAS**

SINCE you elected me your president here a year ago, I have had many nice things happen to me. But, this occasion is, I think, the nicest of all. To be given the opportunity to stand here on this platform, to be able to look into the faces of so many key people in the ranks of Independent telephony, and officially to welcome you to this, the 61st annual convention of the United States Independent Telephone Association, is a great and happy privilege. The memory of it will stay with me for a long, long time.

This has been a great year for Independent telephony and, if you will pardon a personal reference, this has been a great year for Clive Haas. It has, in fact, been the greatest year of my life.

As your president, I have traveled far and wide. I have attended a number of state telephone association conventions. At them, I have heard our problems analyzed by expert telephone men. I have heard these same men tell us what to expect in the future and how to prepare for it. I learned a lot about the problems of the telephone business that I never knew before.

This afternoon, I want to look back for just a moment. In recent years, and particularly during the past year, we have read and heard much about rocketry and the space age and how near we are to meeting up with the man in the moon. This is something I've wanted to do since I was a child, but now that the time approaches I'm not so sure. If any of you wants my place in the first space ship, I will gladly relinquish it, provided it has not already been reserved by an enterprising newspaper editor in my state who is conducting a "First-Man-into-Space" contest. He has asked his readers to nominate persons they would most like to have shot into orbit. One man nominated his boss, another proposed his mother-in-law. And, a third man volunteered to make the trip provided he could take along Brigitte Bardot! It is becoming painfully obvious that this first ship into space is going to be overloaded.

I became actively engaged in the telephone business just prior to the 30's. It is with some nostalgia that I recall those days, which were uncomplicated by sputniks, hydrogen bombs, subliminal advertising, and purple people eaters. True, there was a depression. It was a real one, and it lingered on through eight full years of frantic planning and pump-priming. But even so, the 30's were relatively good years in which to live.

We have come through two wars beyond the 1930's. We have witnessed a host of scientific breakthroughs which finally have provided man with the means of destroying himself and his world, or of opening exciting new frontiers undreamed of two decades ago.

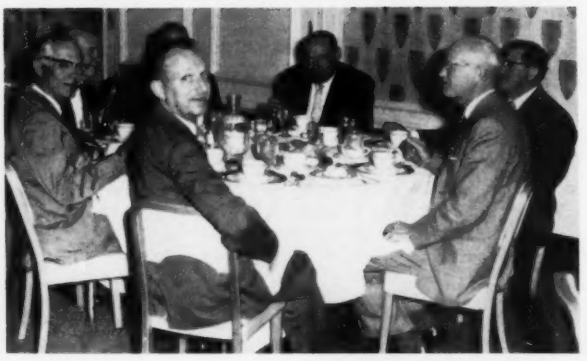
The question of survival is, of course, basic. But life is more than mere survival. If we survive, how shall we live? And, how shall we conduct our business? These, I think, are the paramount questions that we want to consider here today.

Pleasant prosperity for almost everyone by 1982 is the happy prediction of today's experts in many fields of business and science as they scan their statistical charts and progress reports through definitely rose-colored glasses. They say an easier way of life is coming filled with more leisure, more pleasure. Living standards will be higher. Though inflation is expected to continue, buying power will double. And, though the truly rich are expected to increase in number, there'll be an even greater increase in the number of middle-income families. There will be many new job opportunities opening up, following the trend which has nearly doubled employment in the telephone industry during the last 15 years and has created many new types of telephone work.

However, it will not be all work and no play. For, we are told, a big boom in recreation and travel is coming within the next 25 years. And things are going to be different in other ways. Many products, now standard, will have fallen by the wayside of competition, while others, now only dreams, will be pouring out to the buyer in a flood, because businesses of all kinds, including the telephone business, are now spending billions of dollars on research to develop new and better products. Fabulous gadgets for the home are in the offing. Predicted to come are stoves to cook in a flash without heat, windows that raise and lower themselves, house cleaning by button-pushing, foods preserved indefinitely by irradiation, home air conditioning as standard as home heating is today, washers that clean clothes with sound — and everything automatic.

And, what about the automobile? Lower, faster, smaller they will be— and twice as many of them in the 1980's as there are today. The suburbs will double in size, and we are going to be healthier, too! Cancer will be licked, heart ailments curbed, and there will be more help available for mental illness. Many diseases will be completely cured. Our life spans will be substantially longer, and there will be

*Mr. Haas is immediate past president of the USITA and is President of Big Timber (Mont.) Telephone Co.



Directors and officers of the USITA photographed during the luncheon following their convention meeting.

remarkable advances in geriatrics, the science which makes life better for the senior citizens—which is what most of us in this room will be by that time.

Effects on Our Business

Sounds good, doesn't it? And the next question that naturally arises is: How is all of this going to affect this remarkable, romantic and exciting business in which you and I engage ourselves? I wish I knew for sure. If I did, I would set myself up as a consultant and charge you all a fat fee instead of giving you a lot of free advice as I am doing here today.

Although it may still be true that nothing is certain except death and taxes, we do have definite patterns by which to chart our course. One thing we know for sure is that this country is going to grow and that the population is going to increase rapidly in practically every area. This, we know, will create demands for more and better telephone service. So we can start to get ready for substantial station gains without any hesitation whatever.

If the prophets — and particularly those engaged in prognosticating population increases—are correct, the Independent telephone industry may be serving some 11 million telephones by the end of 1960, and we may have in operation some 25 million telephones by 1975, because the figures point up the startling possibility that the number of telephones we have in 1960 will more than double during the subsequent 15 years. With the diffusion of this population over the entire land area of the country, particularly in the suburban and rural localities where so many of our companies are located, and with the possibilities of increased usage of telephone equipment promoted by aggressive sales and merchandising efforts, the future of the Independent telephone industry would seem to be very bright indeed.

However, a quick look at some of the problems we face in meeting this tide of progress is a sobering one, and it emphasizes the fact that we cannot afford to be smugly complacent about the job that confronts us.

Telephone Business Changing

What are some of these problems? Well, to begin with, most of us realize by now that we are face to face with a very important fact, and that is this: The very nature of our business has greatly changed and will continue to change. Our business used to be concerned entirely with voice transmission. Now we are becoming a universal communications system, providing facilities for the transmission of all types of information and data by electrical wizardry. These facilities include teletypewriter service, facsimile service, telemetering service, television channels, radio channels, picture transmission and all other forms of private line services. Engineers tell us that within the next 15 or 20 years a substantial proportion of telephones, particularly business telephones, will be equipped with visual adjuncts. The engineers, also, are experimenting to make closed circuit television, data processing facilities, and other electronic inventions available and economically attractive for short distances.

In the not too distant future, some of our companies will be trying out a completely new all-electronic switching system. Using transistors, this switching system is actually an electronic computer. Like other computers, it contains memory devices. Like other computers, it can be "programmed"—that is, you put into it the kind of memory you want it to have. One of the really exciting things about electronic switching is that altering the system's memory is relatively simple. In other words, it can be easily arranged to provide different tailor-made services for different users. The programs are contained in little photographic memory plates about an inch and a half square. Believe it or not, this little plate can store 250,000 "bits" of information and can direct a lot of switching circuits.

Engineers have told me some of the probable uses that may develop as electronic switching moves out of the laboratory and into regular service. They seem fantastic, but I am reliably informed they are to be taken seriously. Time—or lack of it—precludes me from detailing them here today. But, the important point is that these new systems will have a flexibility and versatility far beyond that of existing switching apparatus. The great attractiveness of the new electronic technique is that it will permit many variations within a practical range. This equipment will help us improve the art of getting intelligence of one kind or another across the miles.

Left to right: Mayme Workman, executive secretary of Independent Pioneer Telephone Association; R. N. Cole of Marion, O.; retiring president of the Pioneer association; Clara Lousche of Springfield, Ill.; and T. P. Roberts of Creston, Ia.

Toll Transmission Improves

Through the years, telephone research has developed long distance transmission systems that carry more and more information. Years ago, for example, we learned how to send several conversations simultaneously over one pair of wires. Then came coaxial cables that carried several hundred conversations, or, alternatively, a single television picture.

Next came radio relay systems which could handle even more information, and improved coaxial cables which could do three times as much work as the earlier ones. And, now, in the offing we have a new radio relay which will take care of more than 10,000 conversations at the same time or a dozen TV programs, plus 2,500 conversations!

But we still haven't come to the end of this road. Under development in the laboratories is a new kind of long distance transmission system — a hollow copper tube called a "wave guide." This is theoretically capable of handling as many as 400,000 conversations at a time, or several hundred TV programs. Regular use of this kind of system is a long way off and much more development must be done, but the potential is there.

At the same time, we're also on the way to increasing the capacity of many local lines, as distinguished from long distance. Up to now, this hasn't been economically feasible, because all wide transmission highways have required vacuum tubes, and the cost of building and operating vacuum tube equipment on short routes has been too great. Today, however, with transistors and other brand-new forms of miniature electronic apparatus, the prospects are very bright.

What this boils down to is that we can foresee the day when we'll be able to communicate literally *any kind* of information over *any distance*, long or short—every conceivable kind of information such as words, music, pictures, raw data, or mathematical calculations.

Some of the things I've been talking about are starting now, some are near-term prospects, others are farther in the future. They won't all come at once, and they will all take time. But adding them all together, it seems certain that in years to come communication services will be of greater importance to the community than ever before. We'll be serving more people, we'll be serving them in more ways, and, naturally, as this occurs, we'll continue to grow in size and responsibility.

In order to hasten the days when these new things will be practical for common use, engineers and equipment manufacturers, both Bell and Independent, are spending millions of dollars in research and development.

Modern research and development are no longer entirely dependent on isolated individual inspiration. In today's scheme of things, it is a team effort. It takes vast quantities of money, intricate machinery, the best scientific brains that can be developed—all concentrated on the task of producing improvements in a given area. Research has shown us that electronic switching holds promise of many revolutionary advances not only in telephony, but in the entire field of communications and controls. For instance, transistorized switching equipment with no moving parts will increase speeds of data transmission to a degree that seems fantastic in the light of present-day equipment. Much equipment will be miniatured to one-fifth its present size. Costs—and this is important—will be reduced right down the line. A host of innovations in telephone service will become commercially practical.

Several important versions of existing products either are in production now, or soon will be, thanks to the men of our laboratories. To cite just a few, a dial operated mobile radio-

telephone system was tried out successfully this year. While the mobile radiotelephone is not new, this system will enable subscribers to originate or receive local mobile radio station calls without operator assistance. A new and improved dial lighted telephone has just been introduced, along with a transistorized hands-free telephone which eliminates the bulky amplifier and control box.

Today, long distance lines are alive with a variety of traffic other than words. Electrical impulses, routed along telephone circuits, are working all manner of miracles. They are automatically transmitting orders from all over the country to a central warehouse in St. Louis—telemetering the flow of a Texas pipe line—monitoring radio transmitters—flashing burglar alarms—setting type for printing simultaneously in three or four different cities.

Dynamic Growth Expected

This broad new concept of telephone service is one of the factors behind the dynamic growth we can expect for the telephone industry. This concept presents a wide area of challenge and opportunity. Developing equipment to handle, route, transmit and receive this ever-increasing volume of high speed traffic puts a real premium on creative engineering. New jobs will be created; more men and women will be needed to fill them. These innovations will offer new exciting career possibilities for scientifically and technically trained people in a vibrant and vital industry for a long time to come.

There is not much doubt that the demand for individual line service will continue and even increase throughout the country for many years into the future. Party line service, never popular, is just not adequate today in the average residence where the telephone usage is high. People of this day and age are too impatient to wait their turn in sharing a line with others. This is one of the many challenges to be met.

How shall we respond to the job that lies ahead? We can respond with boldness and imagination, or with timid caution. If we are going to tackle the job with boldness and imagination, we are going to have to have good earnings, and that subject alone is a chapter by itself. How can we, as a regulated industry, build economically for the long-range pull if our earnings are not in keeping with other forward-looking businesses so as to allow us to compete with them in the money market? It is basic and fundamental that we must convince regulating commissions of the need for adequate earnings.

To do the job that lies ahead will require various tools and instrumentalities. Those instrumentalities at our disposal include the state telephone associations and our own United States Independent Telephone Association. (While membership in our Association has increased substantially during the past few years, there is still room for growth.)

It has been my happy privilege to have served as president of both my state association and our national association, and I want to say to each and every one of you here today that no company can afford not to be affiliated with both his state and national association. As a member of the board of

Elnathan Gates (left) of Minneapolis, Minn. and P. A. Nenzel of San Francisco, Cal.

directors of the United States Independent Telephone Association, I have long been familiar with its activities. I have known that these activities were fruitful, but I never really realized how fruitful they were until this last year during my incumbency as your president.

Performs Many Services

In truth, I have been amazed and astounded at the many services our association, through our full-time Washington staff and our committees, has performed and is performing every day. I am sure that most of you know what these services are, and time does not permit me to go into detail. The detailed accounting is contained in the report of our agile, alert and competent executive vice president, Clyde Bailey. Copies of his report as usual are available for distribution, and I hope each of you will take this report home with you and read it carefully in its entirety.

However, there are one or two matters of importance which emphasize the great work that our association is doing, and which are of great importance to everybody in the industry. I don't need to tell you that our most important activity, at least the one which means more to us in dollars and cents, is that of obtaining for our companies our proper share of toll revenue. Full realization of this was what prompted us a few years ago to employ the services of a full-time toll engineer and to set him and his associates up in an adequately-equipped department. This step is paying off, and it will be even more compensating to our companies as time goes on. These innovations and changes that I have been talking about this afternoon are going to make the negotiation of toll traffic agreements with the Bell System more complicated and more necessary than ever.

The problems facing Bell and Independent companies in toll settlement matters are going to be more dependent than ever upon experts in this field.

A constructive start in that direction has been made within the past few months. As most of you know, a task force under the direction of USITA's sub-committee on message toll compensation was called to Washington to prepare a USITA Separations Manual for Independent company use in reaching telephone message toll settlements with Bell System companies. These task force members removed their neckties, rolled up their sleeves and went to work on May 6, and they did not complete their job until Aug. 1.

The new manual, which soon will be ready for distribution, includes separation procedures following the principles set forth in the revised 1957 NARUC-FCC Separations Manual to the extent of their application to Independent company operations. The draft of the new procedures written by the task force includes a detailed analysis of all items to determine their effect on special studies of message toll telephone business interchanged with Bell System companies.

I am confident advantages will accrue to our operating companies in the form of substantially increased compensation for the use of our facilities in the transmission of long distance messages. Our association, and the entire Independent industry, owe a debt of gratitude to the task force members that we never can fully repay, but I am happy this afternoon to be able to make this public acknowledgment of their important services.

Radio Increasingly Important

Another phase of our business which is becoming of increasing importance is the use of radio. Realizing its potential, our association employed the services of a full-time radio engineer. Those

(Please turn to page 120)

Excerpts of Report of

USITA Executive Vice President

By CLYDE S. BAILEY

NO ONE can review the activities of the USITA without being aware of its increasing influence as a trade organization. No one can be a part of the association without being conscious of the profoundly important effect of national forces upon the character and welfare of Independent telephone companies. Neither can anyone familiar with the operation of the association fail to be cognizant of its growing impact on national affairs with which it deals.

The past year has been one of the most active in the long history of our great association. This has been true on the legislative front, on nationwide toll compensation studies, on matters pending before the Federal Communications Commission, and on many other subjects. In the various areas in which the association's full time staff has functioned it has had the benefit of the warm cooperation of the association officers, its committee personnel, and many persons connected with individual operating companies. We have also had the finest kind of support from the state associations.

It has been this cooperative effort that has enabled your association to function in the efficient manner it has during the past twelve months. . . .

Toll Compensation

Ranking high on the agenda of USITA activities is work on toll compensation matters. A report from our competent Toll Compensation and Settlements Committee will be available at this convention, and our toll engineer will deliver an address on the status of toll settlements at our first general session. . . .

Investigation of FCC

At the last session of Congress the House voted $250,000 to enable its Interstate and Foreign Commerce Committee to make an investigation of all federal regulatory agencies to determine whether they are administering their laws as Congress intended. To conduct it a special Sub-committee on Legislative Oversight was created with Congressman Moulder (D., Mo.) as chairman. Speaker Sam Rayburn, who was chairman of the main committee during the New Deal days of the 30's when some of the agencies (FCC, FPC, CAB, SEC) were created, strongly supported the proposed investigation. Professor Bernard Schwartz of New York University Law School was chosen as the sub-committee's counsel.

The FCC was chosen as the first agency to be probed. . . .

Beyond any question the Commission's prestige may have been temporarily impaired by the headlines the investigation produced. But it is important to bear in mind that neither the sub-committee nor the main committee has yet sifted the many allegations that have been made. Some of the charges are doubtless exaggerated. The question of interest to regulated industry and the public generally is what amendatory legislation will emerge after the investigation has been completed and conclusions have been drawn. . . .

After some recommended amendments to the Communications Act are enacted and a code of ethics is adopted, I believe the atmosphere surrounding the commission will be clarified and its prestige will reach new heights. . . .

Lease Maintenance Case

The so-called lease maintenance case (Docket 11972) continues to engage our active interest. In this proceeding, the AT&T a year ago filed tariffs with the commission offering on a common carrier basis radio communication equipment and facilities together with maintenance service to private communication systems. At hearings begun before Examiner Bond in January of the current year the offering attracted large opposition from private firms which have been furnishing this type of service to various users.

The opponents asked the commission to reject the Bell tariffs on the ground that the service contemplated is not a common carrier one. They also contended the Bell System is precluded from offering this service under the consent decree in the AT&T-Western Electric anti-trust case which enjoins the Bell System from engaging in any service which is not common carrier communication.

The California commission a year ago sustained related intrastate tariffs offered by the Pacific Telephone & Telegraph Co. Its decision has been sustained by the supreme court of the state.

The private communication system users have enlisted the sympathetic interest of the Department of Justice which has written letters to the commission expressing its views but has not presented evidence.

Our association, an intervener, has participated in the FCC hearings and will file a brief on the legal aspects at the proper time. Although Independent companies are not affected by the decree in the Western Electric antitrust case, they are interested in having the lease maintenance service declared a common carrier one. . . .

Growing Importance of Radio

In addition to the lease maintenance case mentioned, there are several radio proceedings before the FCC in which our association has taken a direct interest. Our purpose has been to try to stake out a claim in the radio spectrum for telephone company use on a common carrier basis. The telephone

industry contends that maximum conservation of the radio spectrum can come about only through the allocation of frequencies to telephone common carriers, which by law have the duty and responsibility of serving the communication needs of the public at just and reasonable rates and without discrimination.

Students of the application of radio have expressed the opinion that every Independent telephone company will be using this relatively new technological tool to some extent as a supplement or aid to its wire telephone service within the next 10 years, or will fail to keep abreast of telephone service demands or of the march of technology, or both.

Evidence of the increasing use being made of radio by Independent telephone companies is attested by the fact that 98 companies are now using this means to provide mobile radio telephone service or to supplement or replace interexchange land-line facilities.

It is because of the growing importance of the radio tool that a radio engineer was employed by our association on a full-time basis at the beginning of this year. The person chosen, Thomas R. Warner, has had a wealth of experience in the practical utilization of radio in the communications field. Member companies should feel free to write him for advice upon any problem within his sphere of duty. . . .

Maintenance Radio

With the scramble for frequencies that exists in a radio spectrum that has physical and technical limits, it is impossible for the FCC to satisfy all demands, particularly with an existing policy under which allocations of radio frequencies are made on a piecemeal basis. This is why competing applicants are frequently frustrated.

An instance in which the commission finally yielded to the entreaties of telephone companies is to be found in the establishment on June 23 of a Telephone Maintenance Radio Service. With frequencies now made available, telephone companies for the first time are permitted to use radio in connection with their construction and maintenance activities without at the same time being required to furnish a radio communication common carrier service to the public.

The details of the Telephone Maintenance Radio Service were set forth in a memorandum prepared by our Mr. Warner and sent to all member companies last summer. . . .

Left to right: Dale Patrick of Frankfort, Ind.; James O'Connor of Star City, Ind.; R. V. Achatz of Aurora, Ind.; H. E. Purcell Jr. of Rising Sun, Ind., and Darwin Sayers of Star City, Ind.

Microwave Case

Our association is a party to the microwave radio proceeding pending before the FCC in Docket 11866 involving a number of issues of vital importance to our industry. At hearings held in the spring and summer of 1957, five USITA witnesses presented testimony in support of our thesis that communication common carriers should receive priority in the allocation of frequencies. They testified as to the imperative need of Independent telephone companies for frequencies above 890 Mc.

They also informed the commission of the detrimental effect which would flow from licensing private communications systems to provide industrial users with radio facilities in a field traditionally occupied by telephone companies. . . .

In April 1958, without specific reference to this proceeding and without prior notice, the commission issued an order which transferred the 890-940 Mc frequencies to government radio-positioning operations as an urgent national defense requirement. While this order prevented any further expansion and installation of stations by telephone companies and failed to provide an alternate frequency band for this vital service, it did permit continued use by presently authorized stations until 1961. Our association filed a Petition for Reconsideration and Stay of this order until an alternate frequency band could be provided and recommended the 50 megacycles immediately below 890 Mc as the most suitable replacement.

On July 31, the commission released a further order denying our petition along with those of several telephone companies and of other interests. However, the way was left open for further consideration of the use of 840-890 Mc by telephone companies by referring this proposal to another pending commission proceeding, docket 11997.

Left to right: Ray Blain, TELEPHONY's technical editorial director; O. L. Moody of New York City, and Francis X. Welch of Washington, D. C.

Motorola Petition

Another of the more important FCC proceedings in which we have found it desirable to take part is one involving a complaint filed in late July by Motorola and five maintenance and service organizations. . . .

The main target of the complaint is the Bell System inasmuch as 99 per cent of present mobile radio telephone subscribers are in Bell territory. There are, however, facets of the complaint which are of substantial interest to our branch of the industry. . . .

Among other things, the complainants contend:

(1) That common carrier mobile systems should not be authorized as an adjunct to wire telephone exchange business.

(2) That the public interest demands competition in the field without which independent manufacturers and service organizations will inevitably be prejudiced and ultimately destroyed.

(3) That the commission should determine whether telephone common carriers should be required to permit private carriers to interconnect with their landline facilities.

Motorola and its co-complainants point out that refusal of interconnection with telephone facilities makes it impossible for the private carriers to offer a truly competitive service. . . .

The complainants assert that the Bell System under the consent decree in the Western Electric anti-trust case is precluded from offering mobile radio service equipment on a lease and maintenance basis. This particular matter is not one in which Independent companies are directly interested; but they are interested in a correct determination of the broad legal question as to the exact nature of such an offering in view of the fact that in their own territories a number of Independent companies are now providing this type of service and undoubtedly others may wish to do so in the future in order to meet demands being made upon them. . . .

Foreign Attachments

Another attack on the foreign attachment provisions of telephone tariffs was made in August when the American Radio-telephone Research Corp., Inc. filed a petition with the FCC relating to its Microphone Control Unit. This is a device which according to the petition can be physically connected between the switchboard panel and the operator's headset, and enables the operator in response to an incoming call to hold the call, use her headset for paging or speaking over another communications system but not as a part of it, and report back to the caller. . . .

Any decision that might emerge from an investigation of this matter will have a bearing on the interests of Independent telephone companies. Our association at the proper time will submit to the FCC a "Statement of Position" pointing out that the test of propriety of any foreign attachment is how it affects telephone service, and that under any set of circumstances the attachment should be furnished by the telephone company and maintained by it. . . .

Left to right: R. M. Wopat of Northlake, Ill.; J. R. Harper and Duane T. Swanson, both of Charlottesville, Va.

Menomonee Falls Case

The past year has witnessed a proceeding before the FCC involving the proposed acquisition of the Menomonee Falls and Lisbon Telephone companies by the Wisconsin Bell, a proceeding in which our association intervened and presented testimony in opposition. The Independent properties are on the periphery of Milwaukee. Before it was known that such an acquisition was in prospect, our executive committee on Nov. 22, 1957 took cognizance of a report of an enlargement of the grounds upon which Bell System companies would hereafter acquire Independent property to include community of interest and feasibility of integration. The committee by resolution stated that these changes appeared to be adverse to the interests of the Independent industry and directed the association to intervene in any proceeding before the FCC that might evolve from them.

Our board of directors in March 1958, directed that intervention should be made in the Menomonee proceeding.

The hearing before Examiner John C. Cunningham began on Apr. 23, 1958. It ran for 10 full but not consecutive days. After recesses it ended on May 22. Testimony was presented by the Wisconsin Bell, the Independent telephone companies immediately involved, the Wisconsin commission which had earlier approved the acquisition, and USITA witnesses William C. Henry, Thomas A. Boyd and Daniel DeHayes.

The position taken by our association through its counsel and witnesses was that since there was another Independent company ready, able and willing to acquire the Independent properties, provide adequate service and prepared to pay a purchase price substantially equivalent to that offered by the Wisconsin Bell, acquisition by the latter would not be in the public interest.

After the hearings were completed the Department of Justice at the suggestion of Chairman Emmanuel Celler of the House Judiciary Committee wrote a letter to the FCC calling attention to the anti-trust implications inherent in the proposed acquisition by the Bell company.

At the time of preparing this report for our 1958 convention, an initial

Left to right: R. F. Lucier of Warsaw, Ind.; H. E. Hussey of Durham, N. C., and L. R. Thurston of Harrisburg, Pa.

decision by Examiner Cunningham was being awaited. . . .[1]

Legislation

I shall refer to specific pieces of legislation later. Suffice it for the moment to say that the interests of Independent companies in legislative proposals are such as to demand not only continued alertness but a united and cooperative front.

(a) *Telephone Excise Tax.* It would serve no useful purpose to suggest that the telephone industry may have delayed too long waging an all-out campaign to bring about repeal of the telephone excise tax before the Russians sputniked the world. That no general campaign was waged was due to the fact that, with held orders still on file, telephone companies did not find the tax a sufficient deterrent to telephone service demand.

This discriminatory tax remains a part of the law of the land. A valiant effort was made by your association under the leadership of its Tax Committee to eliminate the tax last summer when the excise and corporate tax extension bill was under debate in the Senate. On an amendment presented by Senator Douglas of Illinois to repeal the tax on local service, the Senate decided to retain the levy by a vote of 43 to 32. A few minutes earlier the Senate had voted overwhelmingly to repeal the 3 per cent excise tax on rail freight and 10 per cent tax on passenger tickets. Elimination of the passenger tax was later stricken by a conference committee. . . .

[1]After my report to our 1958 convention was sent to the printer and set up in galley proof form, the proposed report of FCC Examiners James D. Cunningham and Charles J. Frederick in the Menomonee Falls proceeding was made public. The examiners' report, called an "initial decision," recommends approval of the proposed Bell acquisition and rejection of the various contentions advanced by USITA witnesses at the hearings. The next step will be for counsel to prepare exceptions to the findings of the examiners.

Left to right: Lucille Russell of TELEPHONY; H. D. Fargo Jr., president of TELEPHONY, and Kathryn Bauer of Jefferson City, Mo.

When the tax extension bill was earlier reported by the House Ways and Means Committee it was under a closed rule which prevented House floor amendments. This made it necessary to take our fight to the upper branch. . . .

The reason the railroads won repeal of the 3 per cent freight tax is that they make up a sick industry whose economic woes had been much publicized and dramatized. The reason the telephone industry did not achieve tax victory along with the railroads is that it could hardly claim it was confronted with the economic plight that assailed rail transportation. . . .

Defeat of the Douglas telephone tax repeal amendment caused the telephone industry to lose a battle but not a war. It must continue its efforts to bring about elimination of this discriminatory levy on an essential service.

Later in the session when the Senate Finance Committee was considering a comprehensive bill making many technical and administrative changes in the tax code, the telephone industry tried to prevail upon the committee to attach a termination date applicable to the telephone tax. But, here again, victory was denied despite the fact that a termination date is already applicable to various other things and services. The Finance Committee was fearful that if a termination date were put on the telephone tax, pressure would be exerted by still other interests for a termination date on the taxes on their products. The Treasury Department is known to have been a stumbling block also. Uncertainties arising out of the Middle East situation were likewise factors contributing to the adverse decision.

The way to green pastures and still waters on telephone tax repeal is through individual subscriber demand aided by complaints from consumer groups, chambers of commerce and service organizations. These efforts must be supplemented by telephone companies through keeping the tax subject alive and making effective presentation of facts and arguments to members of Congress, not once but over and over again. . . .

Earlier I said something about the telephone industry possibly having delayed too long the waging of a repeal campaign.

Evidence of this is afforded by what happened in September a year ago. In that month the Federal-State Action Committee that was set up by President Eisenhower to see what could be done to reverse long standing trends of federal aid to states, reached certain agreements. The committee consisted of the Secretary of the Treasury Robert D. Anderson and certain other top federal officials, and 10 governors headed by Governor Dwinnell of New Hampshire.

(Please turn to page 132)

Left to right: J. E. Nelson of Lincoln, Neb.; Mrs. Donald F. Davison of Spencerport, N. Y.; Mr. Davison, and L. H. Meyer of Ft. Wayne, Ind.

Status of Toll Settlements

*By M. H. ALEXANDER**

TOLL SETTLEMENTS represent a substantial part of the revenues required by Independent telephone companies to discharge their responsibilities to their customers.

Revenues from message toll telephone traffic alone, interchanged with Bell System companies, has grown from approximately 12 million dollars in 1936 to over 186 million dollars in 1957. These dollars are 27 per cent of the total revenues of our companies for 1957, which amounted to about 697 million dollars. Revenues from this source should continue to grow as our customers increase and as they make greater use of a service that, through new methods, is becoming faster, more efficient and easier for the customer to use.

The growth of the dollars received from these revenues and their importance to Independent companies made necessary a unified approach to the administration of the settlements. In recognition of the importance of this revenue the tremendous task of dealing with this subject on an industry basis was logically assumed by the USITA. In 1936, the association (USITA) established a "Committee on Teletypewriter and Other Bell Special Services" that was the predecessor of the present Toll Compensation and Settlements Committee. The committee and its sub-committees, on a volunteer basis, have made continued progress in their efforts over the years to increase the level of settlements to Independents and to provide the industry with standardized study methods. As one yardstick of the success of these efforts, settlements for message toll telephone traffic interchanged with Bell System companies has increased at least 34 million dollars annually, based on the volume of tickets at each of the respective adjustment periods.

We would be remiss if we did not, at this time, pay tribute to Ed Blakeslee, who as chairman of the committee from its inception until 1952, and to Roy Jarmon, who has been chairman of the committee since that time, for their outstanding efforts and accomplishments on behalf of the Independent segment of the industry. We are indeed indebted to these gentlemen for their guidance and counsel in this vitally important activity.

In view of the tremendous demands on the time of the committee members, who also have responsibilities to their own companies, the board of directors of the USITA authorized the employment of a toll engineer on a full-time basis, beginning in 1956, to make studies and accumulate statistics for the use of the toll committees and assist otherwise in coordinating the activities of the toll committee and its sub-committees.

Various methods are presently available to any company to determine the amount of settlements for message toll traffic interchanged with Bell System companies. A company may use cents-per-message average schedules that were developed in 1956 based on studies of about 635 selected companies. A company may make a special study of its own operations to determine the amount of its settlements. A company may use previous schedules or other types of agreements. The latest figures available indicate that 37 of our companies are making their own special studies for settlements, 2,790 companies are using the 1956 cents-per-message average schedules, while 563 companies are settling on previous schedules or other types of agreements.

Many of our companies, however, are critical of the level of settlements and the time lag involved in providing revised settlements schedules for message toll traffic interchanged with Bell System companies. Studies of company operations used in the determination of cents-per-message average schedules or in individual company studies of toll settlements require detailed procedures. When the last nationwide study was completed in 1955, the procedures used were prepared specifically for this study. They were not intended for individual company use.

As an answer to this problem, the Sub-committee on Message Toll Compensation, under the chairmanship of A. W. Lambert, is at the present time preparing a USITA manual which will contain procedures underlying toll settlements for message toll traffic interchanged with Bell System companies. When this manual with its procedures has been completed, which should be in the near future, and when it has been reviewed with the representatives of the Bell System and considered by the Toll Compensation and Settlements Committee, it will provide a method that may be used by individual companies in a study of toll settlements as well as providing procedures for studies required for determining the cents-per-message average schedules that are used by the great majority of our companies.

The work involved in preparing the draft of this manual required three months of intense effort by a USITA task force selected for this purpose working in the association's headquarters in Washington. The toll engineer coordinated the work of the task force and the sub-committees. Our association and our industry are greatly indebted to the members of the task force

*Mr. Alexander is Toll Engineer of USITA.

and to their organizations for their participation in this very important project. The members of the task force, who undertook this tremendous task, were Don Childers, Richard Gabel and Everet Karlsson, with assistance at various times by Rod Andrews, John Evans and Ralph Shriner.

I would like to point out that every effort is being made to produce procedures that will recognize the requirement of the smaller company for simplification. Needless to say, it is very difficult to simplify a problem so varied and complex.

The USITA manual now being prepared will respect the framework of the NARUC manual that was revised and adopted in 1957. The previous NARUC manual adopted in 1947 was modified by two addenda—the Charleston Plan and the modified Phoenix Plan. The revision includes these two addenda and recognizes the changes in the operating characteristics of our industry that have occurred since the first manual was issued. The work of preparing a draft of the revised manual was under the direction of the Separations and Toll Rate Disparity Committee of the NARUC. Industry representatives of the USITA and the Bell System assisted in the preparation months of meetings.

The NARUC manual was initially adopted for separations to meet jurisdictional requirements and in view of the precedent an attempt has been made to have the USITA manual recognize, to the extent feasible, the broad principles set forth therein. From a settlements standpoint we as Independent companies are generally not so concerned as to whether the toll that we originate is interstate or intrastate. Our requirement is a fair share of the toll revenues that we originate and terminate with due recognition of our increasing cost in providing this toll service.

When speaking of toll in this sense, I am talking about message toll telephone service that is interchanged with the Bell System. In our new manual we propose to recognize this fact. We must also recognize the importance of adequate toll settlements from this interchanged business. The major portion of our revenues are received from two sources—exchange and toll—and if the revenues received from our settlements are deficient, we can look only to exchange revenues to provide the income needed to meet most of the balance of our revenue requirements.

We live in an increasingly complex age of telephony. We have seen magneto switchboards change to dial—operators change to machines—carrier and microwave replace wire and poles. Each new development increases the necessity for detailed information and study to insure that these new high cost investments in our properties are reflected in revised arrangements for our equitable participation in toll revenues.

Left to right: R. A. Lumpkin, Mrs. O. M. Westrup, Miss Helen Cannon and Mrs. R. D. Carlyle, all of Mattoon, Ill.

To point to one problem of this nature, the Sub-committee on Message Toll Compensation is reviewing settlements for automatically ticketed traffic. At this time, settlement arrangements for this type of operation have been negotiated individually by the companies involved. Information obtained from questionnaires sent by the toll engineer to companies using or planning to use this equipment indicate that a few companies are on a special study basis, some are using modifications of existing schedules while others are using the 1956 cents-per-message average schedules. The Bell System representatives have prepared an illustrative split schedule that provides for settlements higher than the present "B" schedule for manually handled traffic and a lower settlement for automatically ticketed traffic.

N. C. Hasbrook (left) of San Francisco, Cal., and A. C. Herbert of Harrisburg, Pa.

This split schedule is presently being studied. It is, however, the position of the Sub-committee on Message Toll Compensation that, in the absence of adequate data to support this schedule, the present "B" dial schedule should apply.

To properly analyze this subject, one requisite is the information that only the companies who are using this equipment can supply to the committees dealing with the subject.

The new look of telephony goes far beyond our old definition. Conversation is not our only stock in trade today. We should be prepared to provide any communication service that our customers may require. Private line telephone, teletype, data transmission, TWX, to name a few, are commonplace today. The new look of telephony must recognize the demands of our subscribers for such services, as well as for extended area service and foreign exchange service. The necessity for settlement arrangements for all of these services when jointly provided with Bell System companies is constantly being reviewed by the Sub-committee on Special Services, under the chairmanship of William C. Henry, so that settlement arrangements for all of these will adequately recognize the part that our companies provide in furnishing the equipment and facilities needed to meet the communication requirements of our subscribers. I will not detail the status of all of these items but refer you to the report of the Toll Compensation and Settlements Committee.

What is the position of our association in this picture? As a trade association, it does for its members collectively what they find difficult to do

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REA and the Expanding Rural Telephone Market

*By DAVID A. HAMIL**

IN DISCUSSING the future of rural telephony, there are two facts that we might keep in mind. First, the American farmer is willing to pay for modern telephone service. This is no longer conjecture. It has been proven in one area after another where up-to-date service has been made available to farm families.

In today's farming and ranching operations, a modern telephone is a practical business investment, for a farmer is not much more self-sufficient than his neighbor in the city. He has to buy farm equipment and parts to keep it running; he buys seed and fertilizer and insecticide; he buys clothes and shoes and fuel. From time to time, he requires the services of a physician or veterinarian or attorney or banker. Unless he has a telephone, he is in a real fix. He certainly doesn't have time to run into town in the pick-up every time he has to talk with somebody.

If it came to a debate on the question, I would argue that a telephone is even more of a necessity on the farm than it is in the city. A farmer who faces an emergency usually isn't within shouting distance of a neighbor.

Rural telephone service is no longer limited to farm service, of course. A growing number of non-farm people now live in rural areas. Many of them moved to the country from the city, where they grew accustomed to dial service. These people do not have to be sold when dial service comes to rural areas. In addition, there are a substantial number of business enterprises in rural areas today. Needless to say, they have to have telephones.

Rural people will pay for modern telephone service. That is fact number one. Fact number two is that the rural telephone market is getting bigger with each passing year. More industries and businesses are developing in rural areas. More town and city people are switching to rural living. The population of our country is growing at the rate of about 3 million people a year, and a large number of these people are going to live and work in rural America.

These two facts point to a big and growing market for quality telephone service in rural areas. How to meet this demand, quickly and efficiently, is a matter of continuous concern to all of us in REA, but the government's role in this task is limited. It is the business of industry to serve this rural market; it is the business of REA to help the industry.

I am sympathetic with many of the difficulties which you face in trying to meet this market. I am aware that the cost of obtaining materials and providing service keeps going up. New developments in equipment and methods mean better trained personnel — and that is an additional expense. But I am also sympathetic with the predicament of rural families who are without service or whose service is inadequate.

The telephone industry is an industry with a high sense of public responsibility. You have set for yourselves the difficult objectives of developing, throughout the nation, an integrated communications network with uniform service standards. You have made substantial progress in this direction, and you realize that much more has to be done. This meeting and the topics on your agenda recognize the continuing need for closer coordination, for further standardization, and for larger operating units.

More mergers and consolidations of very small systems and farmers' lines will help make modern service a reality in more areas. Improvements in connecting company agreements for toll, for EAS, and for operator office services should be mutually advantageous to Bell, to Independent companies, and to mutuals and cooperatives.

We all know that building and operating a satisfactory communications network is going to require a great deal of initiative, hard work, and cooperation. We also know that it is going to require substantial financing. It is in the area of financing that REA may be able to help you, through long term loans, to accomplish the task of rural telephony.

When Congress amended the Rural Electrification Act to provide for a rural telephone program, it set forth clear guidelines designed to be of the greatest possible usefulness, both to the telephone industry and to rural people.

Let's take a look at some of these guidelines. First, it was the declared policy of Congress that adequate telephone service be made generally available in rural areas "to assure the availability of adequate telephone service to the widest practicable number of rural users." This is the area coverage principle so basic to both the REA telephone and electric programs, and it is a very important principle as far as rural people are concerned.

Second, it was the intent of Congress to avoid duplication of telephone service in any rural area.

Third, while the primary objective is service in rural areas, the Congress provided that when it is determined by the administrator to be necessary in order to furnish or improve service in rural areas, loans may be made to systems without regard for geographical location.

Congress further provided that noth-

*Mr. Hamil is Administrator of the Rural Electrification Administration, Washington, D. C.

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ing in the act should be construed to deprive any state commission of jurisdiction to regulate telephone service which is not subject to regulation by the Federal Communications Commission. State commissions retain jurisdiction, and they are to be commended for the fine spirit of cooperation and helpfulness with which they have worked with our borrowers and with REA.

REA has one very important concern when it makes a loan to expand or improve service, and that is the security of the loan. We must satisfy ourselves that the loan is feasible before we approve it.

After a loan is approved, our chief interest in a borrower continues to be the security of the loan, and our best loan security, of course, is a well-managed business. In all of our dealings with borrowers we recognize that each is an independent business enterprise. I assure you that we have neither the staff nor the desire to manage a telephone company or cooperative. REA is primarily a banking institution; it expects its borrowers to look after their own affairs. Of course, where help is needed and requested, we are glad to provide it.

The best way to find out how REA operates is to ask the management of one of our borrowers. I think they will assure you that we are no more meddlesome than any other group of bankers.

It is from this point of view that I would like to tell you about the progress made to date under the rural telephone program. The first loan was approved in February 1950. By the end of September 1958, about half a billion dollars in REA loans had been approved to 625 telephone borrowers—417 commercial companies and 208 cooperatives. These loans will enable the borrowers to construct 286,000 miles of line, to provide new or improved service to more than one million farmers and other rural subscribers through more than 2,000 exchanges.

Left to right: H. A. Cunningham of Albany, N. Y.; R. C. Reno, TELEPHONY's editor; D. L. Solomon of Washington, D. C.; Vivian Ryden, circulation manager of TELEPHONY, and A. J. Stults, TELEPHONY's advertising manager.

This is truly a nationwide program. REA telephone borrowers are located in 44 states and Alaska. They had, by the end of fiscal year 1958, completed construction of 144,556 miles of line. They were providing new or improved service to more than half a million subscribers and they had placed 1,635 automatic exchanges in operation.

Telephone loans reached their highest level during the last fiscal year, when loans totaling 89.2 million dollars were approved to 204 individual telephone borrowers. Of this number, 66 were new borrowers.

The record of our borrowers in meeting their loan obligations is good, and I am satisfied that it will continue to improve. Currently, 14 borrowers are in arrears a total of $369,000. Compare this with 21 borrowers in arrears $513,000 a year ago, and you can understand why I am confident of the growing financial strength of the telephone organizations using REA's long-term financing.

Much of the great strength and wide public acceptance of both the REA electric program and the telephone program stems from the fact, I think, that they have been administered on a businesslike basis through the years. In the past, we have been able to turn criticism to understanding with reason and facts. I hope we will always be able to do that.

Many of you know that REA borrowers are currently paying less for the money they borrow from the government than the government has to pay on its own obligations. Many regard this as a subsidy.

I am convinced that it is not what a thing costs but what it is worth that matters. Whatever the cost of bringing electricity and modern telephone service to rural America, it is worth every penny of it. At the same time, it is true that, any way you figure, the interest expense to the government on REA loan funds has exceeded the interest we have paid the government.

In the interest of the program, I feel that from this time on, it would be an advantage, rather than a handicap, to pay the cost of money to the government for needed loans. I am stating this view to electric borrowers at current regional meetings. Many rural electric people tell me that they agree. They say that from now on they want to pay their way with an interest rate that reflects the cost of money to the government.

Admittedly, an increase in interest rates might be more difficult for some borrowers under the telephone program than for those under the older electric program. However, I suggest that it would be wise for all systems financed by REA to consider this question carefully. Perhaps a plan can be worked out that is constructive and defensible. I think it is always better to take the offensive, rather than to attempt to defend a position that seems untenable in the long run.

(Please turn to page 146)

Left to right: E. L. Carter of Indianapolis, Ind.; L. F. Shepherd of Erie, Pa., and H. D. Holderness of Tarboro, N. C.

Operating Challenge To REA Borrowers

*By E. C. WEITZELL**

(An REA Conference Address)

I AM HIGHLY honored to have the privilege of appearing before this nationwide assembly of REA borrowers, and to be able to bring you the greetings of my associates and Administrator David Hamil. I am sure that he would like to be here this afternoon. All of us in REA are proud of the progress that the telephone borrowers have made during the past eight years, and we are looking forward to the growth and development that must take place during the years ahead.

REA borrowers are an unusual group of business enterprises. Only a few years ago many of you were non-existent, others were small family enterprises without much hope of growing into effective communications systems, and all of you lacked the necessary financing to carry out programs of rural communication development and improvement that were sorely needed. Congress stepped into this picture in 1949 and provided the rural telephone loan program, through which each of you has been commissioned to perform a public service to the rural people of America that was not otherwise being provided. The story of your development is typically American. Each of you is doing what would be the impossible, except for the partnership with your companies that the Congress made possible.

REA borrowers are breaking all precedents insofar as the financing and development of rural telephone service are concerned. The conversion of farmer lines, family enterprises and the small mutual systems into modern dial telephone systems almost overnight is the type of thing that could only happen in a great country such as ours. Sometimes the temporary delays and the growing pains that all of us suffer may seem unnecessary and unfortunate. In fact, some of them may have been.

On the other hand, when we stop to think, we must realize that the Independent telephone industry had depended on somebody else for so long that it had a dearth of leadership in almost every line of activity. Management was weak, and accounting was non-existent in many companies. Qualified engineers were few and far between, and adequate long-term financing was not available. When we think back over this situation, the companies which you represent here today are proud examples of the rejuvenation and rehabilitation that must take place throughout the Independent telephone industry.

W. G. Winters of Houston, Tex., chairman of USITA REA Borrowers' Committee. Mr. Winters presided over the conference of REA borrowers at the USITA convention.

REA Borrowers Do Job

REA borrowers, as small businesses, are doing a job that many said couldn't be done. But, now it is being done—in a manner more complete and more adequate than ever before.

It has been only a few short years ago when "area coverage" was more or less a naughty word. Recently, this term has become universally employed to express the aim of providing rural telephone service to the widest practicable number of rural subscribers. This is the job that Congress has commissioned REA and its borrowers to do through the provision of long-term credit, essential to the financing of rural utilities.

Each day and month brings about new challenges to the small companies and cooperatives that are shouldering the responsibility for providing rural communications service. REA borrowers are not only keeping up with the larger companies in providing a standard of service second to none, but they are pioneering new fields and new frontiers. For example, many industry people assumed that the small companies should not own and operate toll facilities. With proper and adequate compensation available this concept is being modified completely and Independent companies and cooperatives are taking their place in the provision of every type of communication facilities needed in rural areas. Extended area service, as a method of integrating the rural and town portions of a single community of interest, is another frontier which REA borrowers, in particular, have pioneered during the last several years. Although much progress has been made toward providing extended area service on a proper and

*Mr. Weitzell is Chief of Telephone Operations and Loans Division of REA.

equitable basis, much more remains to be done.

REA borrowers are forging ahead on numerous fronts, including the development of new concepts in rate-making; the development of improved methods of buried plant, new and improved line materials; and standards of construction equivalent to the best in the industry.

To many, the developments and accomplishments of the rural telephone companies and cooperatives are astonishing. It is hard to believe that these newcomers are taking their places as full-fledged communication companies and systems with the ability to meet their responsibilities as first-class members of the industry. Whereas, the Independent companies formerly were classified as switcher companies, you are providing convincing proof that this type of operation is gone forever. Incidentally, it may take a while to get the word around, but sooner or later it will be apparent that the switcher-type of relationship between community centers and the surrounding rural areas is an antiquated, inefficient and unsatisfactory method of providing telephone service. It is increasingly obvious that the company which assumes the privilege of serving the community center also should recognize its responsibility for serving, on an integrated basis, the surrounding rural areas upon which the community center depends.

REA borrowers have been foremost in their leadership in integrating both the rural and urban portions of the communities of interest for which they assume responsibility. Your leadership will, undoubtedly, have a stimulating effect on the entire industry.

How Do You Do It?

The story of REA borrowers in modern rural telephony may seem too good to be true! The unconventionality of providing 100 per cent debt financing to small businesses, such as your companies, is surely in conflict with the financing and credit principles which many of us were taught. And, I have heard it said, many times, that such a practice is unsound and doomed to failure, along with the companies involved.

Left to right: Howard Bersted of Chicago; Ralph Odegard of Menomonee Falls, Wis.; J. W. Holt of Stillwell, Okla.; Morris Burton of Tyler, Tex., and F. M. Clark of Rochester, N. Y.

Here, again, REA borrowers are pioneering in the field of utility financing. Since telephone service is normally provided on a monopoly basis, and not subject to the usual competition, it is quite apparent that the source of capital does not determine success or failure. The important question is—can we make it pay? With the supervision of our regulatory bodies and the technical assistance provided through REA and the industry's trade associations, there would seem to be no reasonable basis for believing that REA borrowers cannot meet their debt service responsibilities, even though their debt equity ratio may be substantially higher than is considered proper as a basis for conventional private financing. In fact, the experience of REA borrowers, to date, is decided proof of their ability to do the job and do it well.

Financing is basic, but too often there may be a tendency to attribute the success and progress of REA borrowers to financing alone. Complete and adequate financing on terms suitable to the job to be done is essential, of course. But money alone is not all that it takes to make a rural telephone system successful.

First, it's got to be large enough to represent an effective and efficient operating unit. Many of our rural telephone systems are still too small, and they should make every effort to expand in keeping with the growing demand for revenues as a basis of operation. However, size is only one of the several factors that may contribute to success or failure. Frequently, we hear it said that the absolute minimum size for a successful telephone company is 500 stations, 1,000 stations, or 2,000 stations. All of these can't be correct, and, in fact, none of them is. The particular circumstances involved, including the character of management and the demands for revenue, determine the possibilities for success in any particular case.

Most important of all, the long-term success of a rural telephone enterprise will depend on the quality of service that it provides and the soundness of the organization and management which operates it. Again, REA borrowers have pioneered the field in providing adequate engineering, as a basis for their financing program and as a basis for a continued maintenance and operations activity. It is not unusual to have it said that the Independent telephone companies got along without all this engineering before REA came along. We would agree that they got

Left to right: R. D. Featherstone of Arlington, Va.; A. O. MacLane of Anchorage, Alaska; M. B. Simonson and Col. R. Waters, both of Arlington.

along, but not very well, and part of their lack of progress can certainly be attributed to the fact that adequate system planning was absent from the conventional method of operation. The adoption of basic construction and maintenance standards, which do not permit gold-plating but which provide facilities capable of rendering first-class communications service, should enable REA borrowers to meet the long-term operating challenge in a most successful fashion.

In this connection, permit me to remind all REA borrowers and applicants of their responsibility for close supervision of all engineering and construction work. It is essential that established standards be closely followed. To fall below is to sacrifice quality and to exceed is to unnecessarily increase costs. The retention of existing usable plants offers substantial cost reduction possibilities that may frequently be overlooked.

A major aim of the REA program has been to keep per-station investments at an optimum level and to achieve a standard of construction that will minimize operating and maintenance costs. This, in turn, should make it possible to render service over the long period to the widest practicable number of rural subscribers at reasonable rates. This is the operating challenge which every REA borrower assumes the responsibility for meeting.

Management And Operations

It has often been said that management is the weakest aspect of Independent telephony. Now that more adequate financing is being provided, this statement would seem to have much validity. The character of the Independent industry, with its thousands of small companies, cooperatives, and low earnings, has not been conducive to the development of leadership, managerial skills and operating personnel trained in the technology of modern telephony. Consequently, you, as REA borrowers, have been faced with the need for developing and training personnel, along with the expansion and improvement of your plant. Considering the many obstacles you have faced, you have come a long way.

Management, whether it's good or bad, consists of many elements that appear intangible to the average person. What do we mean when we say to each other that we must improve this factor that is so essential to the success of our several enterprises? And, I might add, so important to the security of the REA loans. Briefly, management may be defined as "the guidance given to a business enterprise."

Let's put the microscope on management for a moment. In order to provide adequate guidance, we must know what's going on. How do we know what's going on? Adequate accounting and internal controls are paramount in this first step toward good management. Without accounting there can be no operating reports, and without controls we cannot know what is happening to materials, equipment and the time of the employes under our supervision.

Of course, it's useless to know what's going on if we don't do something about it when the need is evident. Frequently, we have suggested to REA borrowers that if they do not already provide operating reports every 30 days for managerial guidance, they should establish such a practice immediately. More important, however, is the desirability of knowing what is in these reports and of using them as a basis for the decisions which management must make today and tomorrow. As you analyze these reports, you will develop new ideas and more efficient methods for handling your day-to-day activities. The creation of new ideas is the essence of management and the lifeblood of a successful business.

In your business, what is next year likely to bring? Have you a plan and a budget as a guide toward the future, upon which your current decisions and actions are based? If you haven't, I doubt that you know where you're going! The budgeting of revenues and expenses and the planning and budgeting of capital improvements is essential to a soundly managed company. Monthly operating reports and annual budgets should become a regular practice of each and every REA borrower.

What are your personnel policies? Have you established a training and safety program? Do you concern yourself with the welfare of your employes? Unless you do, you can hardly expect them to be concerned about the welfare of your business. If every employe in your organization is not selling telephone service and promoting your company in his everyday life, you are wasting one of your greatest resources.

There's probably no other business in which public relations and the quality of service rendered are so important as the telephone business. Communications is your only reason for being, but, unless the job is performed as your subscribers want it, the grapevine of malcontent and disrespect may climb all over and smother your telephone company.

Most important of all, perhaps, is the financial guidance that management provides to an enterprise. The long-time success of your business will depend on whether you build adequate reserves for depreciation, replacement, and contingencies that might face your organization in the years ahead. The strength of the REA financing program will depend on whether you, as borrowers, build net worth on the basis of sound financial planning and whether you meet your debt service to the United States Treasury. Your progress, to date, is gratifying, but we must plan to move ahead. Stagnation is the sentence of death to any business enterprise.

Demands For Rural Service

The alertness and capacity of management will determine its ability to meet the ever-increasing and changing demands for rural communications service. As the population increases and spills over, more and more, into the suburban and rural areas of the country, we are certain to find that our subscribers are going to be less satisfied with the present quality of telephone service.

We can see the trend toward the elimination of multi-party service in many areas, and the provision of only one and four-party service for all subscribers. The increasing demands for telemetering and data transmission by all types of activities within our service areas make it imperative that Independent companies and cooperatives be prepared to provide the ultimate in communications service. The servicing of SAGE facilities, CAA installations and many other activities dealing with the security and defense of our country, and mobile service for numerous types of business enterprises will require an increasing amount of our attention. If REA borrowers are able to keep up with these many demands, they must plan ahead.

During the course of developing our long-term financing programs, a number of practices and concepts have required changing. For example, the old practice of expensing system extensions, rather than to capitalize them, has been one of the leeches of small-system telephony. This leech has bled our small companies lifeless by the gradual elimination of their rate bases. Together with the failure to establish adequate reserves, many small companies were left without capitalization and without the basis for obtaining conventional financing. It is important that practices of this type be eliminated at once.

Small companies and cooperatives are involved in another rapidly changing scene. We have already referred to the fact that you are no longer in the switcher class. You must, and you

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We Are All Part of a Great Industry

*By WILLIAM C. HENRY**

(An REA Conference Address)

IT IS A pleasure for me to participate in this, the first REA borrowers conference, to be held as a part of the USITA convention. Perhaps the reason my name is on the program is that I have for some years been chairman of our association's Committee on Problems of Small Companies. That committee, and the 14th Regional Small Company Committees whose activities are coordinated by it, have for some years been on the firing line in attempting to assist our smaller operating units in acquitting their public service obligations in a satisfactory manner. We think some good has been accomplished from these efforts, but we know full well that much remains to be done.

It is unnecessary to draw attention to the importance of the business in which we are engaged nor to the instrumentalities used in it. So vital is telephone service that, over the years, state legislatures have seen fit to provide for its regulation and control through public agencies which we know as public utility commissions. In 1920, Congress enacted legislation dealing with the interstate regulation of telephone companies, and in 1934 it created the Federal Communications Commission and transferred regulatory authority to it while at the same time conferring expanded controls.

Following World War II, increased emphasis was given to the communication needs of the country by the introduction of legislation enlarging the jurisdiction of the REA by empowering it to make loans for telephone purposes. In a declaration of policy accompanying the telephone loan amendment to the REA act, signed by the President on Oct. 28, 1949, the Congress of the United States said:

". . . it is hereby declared to be the policy of the Congress that adequate telephone service be made generally available in rural areas through the improvement and expansion of existing telephone facilities and the construction and operation of such additional facilities as are required to assure the availability of adequate telephone service to the widest practicable number of rural users of such service."

Nine years have elapsed in the meantime. Under generous appropriations made by Congress a total of $495,396,-015, almost a half billion dollars, has up to Sept. 1, 1958 been lent to the various kinds of telephone borrowers declared eligible by enacted law. The number of borrowers today is 619. This large sum of money affords eloquent evidence that there was in fact in the judgment of the Congress a need for a public source of money to provide telephone service for vast numbers of people. I think it must be evident to at least everyone now, that without such a source many people now enjoying telephone service in sparsely settled areas where service by commercial companies was not economically feasible, would be without it today.

I am not a prophet. I have never pretended to be one. But from such evidence as I have seen, it seems apparent that the REA is going to be with us for a long time. The fact that some people look with horror upon the government being in the lending business is beside the point. The Congress of the United States in its composite judgment enacted the law. The lending agency is here. It is not a theory. It is a fait accompli.

As a director of USITA, I am glad to say that all of these borrowers are eligible for membership in our great organization. Not only are they eligible, but our board of directors, by two resolutions, has directed the waging of a campaign to induce REA borrowers to affiliate. The invitation to join is extended to every entity providing telephone service—commercial companies, cooperatives, mutuals, limited dividend corporations, and any others. It does not make any difference what the legal status of a borrower is, so long as it is a part of what we regard as the Independent, or non-Bell segment of the telephone industry.

Now, I am well aware that in certain quarters not completely familiar with the workings of the USITA, it is asserted that the USITA sought to prevent the enactment of a telephone lending amendment. I may as well tell you there was a well defined and definite view in much of our industry, back in the late '40's, that telephone companies on the whole were doing an acceptable job in putting telephones in rural areas and on farms as well as in the cities and that, given time, the job could be accomplished without government assistance or aid.

That opinion was earnestly entertained. It was entertained at a time, not long after the end of the war, when the government was already heavily overloaded with debt which had reached unprecedented proportions, when international commitments were positively staggering, and when the American people were shouldering taxes the magnitude of which threatened the continued existence of a free economy, if not a free nation.

I think it is certainly evident that the event has proved that the postwar telephone service job has been done faster with the help of REA financing, than it could have been done in the absence of government aid.

But, there were some special reasons

*Mr. Henry is President of Northern Ohio Telephone Co., Bellevue, O.

back in the late '40's, if you will pardon a brief turning back of the clock, why telephone lending legislation was resisted. If you had been charged with the duty, as some of us were, of dealing with that legislation, I am confident you would have done what was done by others in an attempt to resist the legislation, in the form in which it was originally presented, and until certain definitely harmful provisions were eliminated.

As the bill was first drawn and considered at congressional committee hearings, its terms were broad enough to produce public ownership of telephone facilities and service. I want to tell you that I know what I am talking about because it was my duty to give honest and careful study to the bill's terminology. Under the bill, as originally presented, it would actually have been possible for municipalities to borrow REA money to go into the telephone business either by buying out an existing company or by building a new telephone plant to be operated in competition with the existing commercial one.

Where is the man who is so bold today as to be willing to say that such public ownership should be encouraged as a part of congressional policy, in a nation of free men dedicated to the preservation of a free economy, a nation that has long led the world in the development and use of telephone service, indeed a nation which then had and still has more telephones than all of the rest of the world combined? Yes, the public ownership provisions of the original telephone amendment to the REA act were objectionable, and they were objected to with all the force the telephone industry could bring to bear.

And, where is the man who in his considered judgment would be willing to say that the provisions of the bill in effect authorizing competition in the telephone business in individual communities is in the public interest? Competition in the telephone business went out with the horse and buggy. The public did not want it because it found it was necessary to have two telephones and pay two different rates in order to be able to reach all subscribers. The provision in question was additionally objectionable because the competition that would have been possible would have been furnished through municipalities in many cases.

There were certain other bad features in the legislation, features which I am sure you would have objected to if you had been on the legislative firing line. I shall refer to only one more.

The bill in its original form had this totally illogical and unworkable feature: It provided that the REA administrator in making loans "shall, insofar as possible, obtain assurance that the telephone service to be furnished . . . will be made available to the widest possible number of rural users at rates which are within such users' ability to pay."

Left to right: F. W. Hamper of Marion, O.; E. M. Blakeslee of Santa Monica, Cal.; L. F. Roberts of Washington, D. C., and Herman Sondov of New York City.

Those words, "within such users' ability to pay," naturally gave concern. What did they mean? The bill set forth no standards to guide the administrator in reaching his determination. Was it the financial ability of the poorest subscriber on the line? Was it to be the richest? Was it to be an assumed average of the financial ability of all the subscribers? Or was it to be merely the best guess the administrator could make? What would be the impact of such provisions upon the rate making authority of regulatory commissions? How much would the users' ability to pay have a bearing on the question of economic feasibility and repayment of telephone loans?

Admittedly those provisions also were bad. Congress thought so too, after objection and arguments were presented at committee hearings. These provisions, like the ones relating to public ownership and competition, were eliminated. The intention of Congress to avoid duplication was spelled out. Other satisfactory amendments were adopted by Congress before legislation was finally enacted. What happened then so far as the USITA was concerned? A member letter from the Washington office of our association dated Oct. 21, 1949 carried this language:

"The bill in the amended form now agreed to by both branches represents the judgment of Congress as to what is required. It is recognized that the bill may be of some help to certain small companies which have encountered financial trouble.

"As American citizens with a belief in majority rule, telephone people will accept the verdict that has been rendered. The managing body of our association, our board of directors at our convention in Chicago last week decided that the imminence of legislation in the democratic way now calls for an offer of cooperation by our association to the REA in the carrying

(Please turn to page 122)

Left to right: A. J. Falk of Washington, D. C.; G. A. Schumacher of Indianapolis, Ind.; R. D. Pontius of Rochester, Ind., and Russell Hirschman of Indianapolis.

Mechanization in Toll Ticketing and Billing

*By W. H. TODD**

(An Accounting Conference Address)

I FIRMLY believe that the various departments of the telephone industry have always considered the accounting department to be one of the necessary evils involved in their operation. I am also sure you have frequently heard the comment that accounting, and especially the section handling revenue billing, has not changed materially in the last 30 years. Let us review this statement and set out some facts.

Thirty years ago the majority of the revenue accounting functions were handled by the local cashier or some other commercial personnel in each exchange or district office. The charges from the toll tickets were posted manually to a toll statement and at the end of the toll month the toll statement was totaled and the associated local service charges made a part of a telephone statement.

These telephone statements were rarely mailed to our subscribers but retained in the local office until the subscriber made payment at which time one portion of the statement was used as a receipt and the second part held to proof out the cash. This billing procedure made it possible for all the exchanges to prepare charges on a calendar months basis. Later in the 1930's toll billing machines came into the picture. This made necessary a centralization of the revenue billing work and, as the volume increased, the inception of cycle billing came into existence.

The tremendous station growth and volume of toll traffic offered after World War II, and continuing in the early 1950's, have made it necessary to initiate studies for the further mechanization of the revenue accounting job. These studies indicate that a major portion of the economy of the mechanization lies in developing source information that can be read by machine. Since toll tickets comprise the largest proportion of such source information, they are the biggest problem. It is an accepted fact that billing for local service charges is readily adapted to a punched card method of handling.

A number of Independent companies have either installed or are considering the installation of central office equipment to handle Direct Distance Dialing (DDD). The installation of DDD equipment by various areas of the Bell System makes it doubly important that we, in the Independent segment, continue to keep pace by engineering and installing the most modern equipment.

In the years immediately ahead, various studies reveal that the installation of DDD equipment will only mechanize about one-half of the toll message volume and the balance will still be operator ticketed. This condition made it mandatory that studies be conducted to develop methods of converting toll tickets into a form that could be read by machines.

These studies indicated that key punching from manually prepared toll tickets was too expensive and did not provide the type of billing service required. This method of handling toll tickets makes each ticket a new source item each month and repetition of use could never be realized. The only methods which seemed to be practicable were to "capture" the operator pulsing by means of some forms of operator AMA, or have the operator write the information in machine readable form.

Since mark-sensing is a means of allowing the operator to write in machine readable form, and accounting equipment to process mark-sensed tickets is now available, a trial of this system was undertaken. All other systems require extensive equipment design and will probably not be available for some time.

A trial of mark-sensing should have at least the following objectives:

(1) Determine the economics and feasibility of a system of mark-sensing toll tickets by the operators at the switchboard.

(2) Conduct tests at operator training positions.

(3) Assemble the information developed by traffic, commercial and accounting operating methods.

(4) Evaluate the results of the installation.

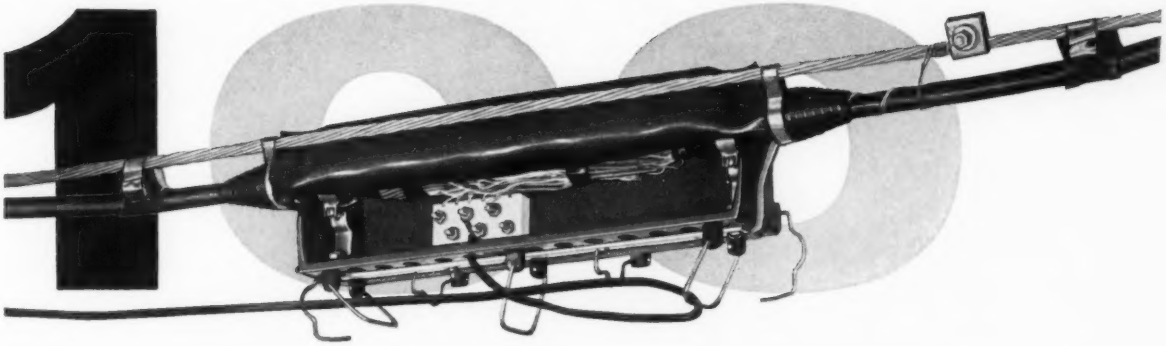
The installation of a mark-sensing program requires some modification of the switchboard equipment in use and also a rearrangement of work loads and procedure in the traffic, commercial and accounting departments. Let us briefly discuss these items.

Switchboard modifications required for mark-sensing are relatively small. The primary requirements are larger ticket compartments to accommodate mark-sensed tickets. The Calculagraph must be modified by changing one handle and cutting a notch in the base plate. Also ticket slots must be enlarged or provided for use in various types of key shelves. The use of pneumatic tubes and ticket filing positions is not required.

The traffic department operating

The report of the USITA Accounting Committee Chairman I. J. Devoe will be published in a later issue.

*Mr. Todd is Secretary and Treasurer of Northern Ohio Telephone Co. of Bellevue, O.



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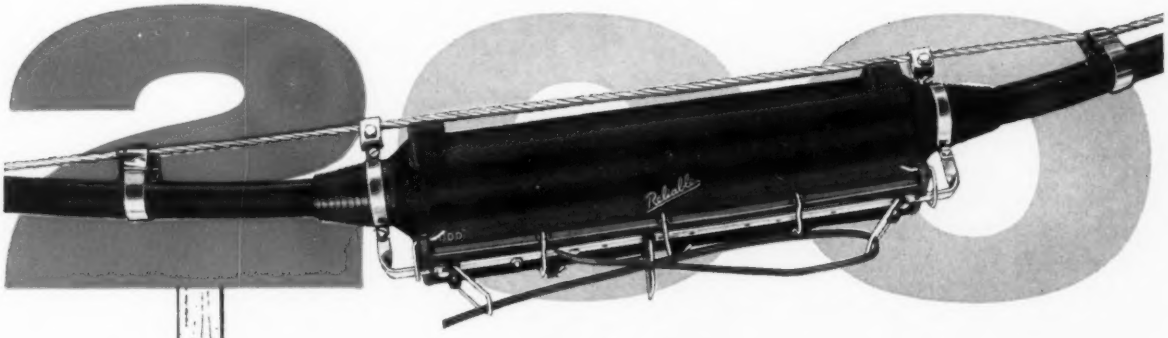

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practices are relatively unchanged and the training of operators can be largely confined to the development of mark-sensing techniques. The best training for this is in actual operating. Therefore, the preliminary training need not be greater than one or two days per operator. When cutting over an office it is contemplated that a few operators would be trained in advance and thereafter the rest of the force would be trained in small groups daily and placed on the switchboard the next day.

An important part of the operators' development in attaining proficiency in mark-sensing would be a review of the tickets rejected by the machine. When possible a mark-sense detector machine should be located in the traffic office for more ready reference of the difficulties incurred. The cost of a mark-sensing pencil is little different in cost when compared with mechanical pencils or ball point pens. The actual traffic cost of mark-sensing tickets might be slightly higher than present cost, but certain other work can be eliminated and furnished from accounting department records.

Some of the potential benefits accruing to the traffic department would be the elimination of ticket sorting, preparation of traffic volume counts and analysis, automatically done by accounting department, as well as peg counts and similiar statistical studies. The automatic computation of elapsed time and charges would eliminate the work frequently done by traffic forces except on calls from coin telephones and those on which the time and charge is to be quoted. Since completed tickets will not be sorted or filed in the central office, it is contemplated that no charges will be quoted on calls after the tickets have left the switchboard positions where the calls were handled.

In introducing mark-sensing to the commercial department, there are a number of matters you should consider in order to maintain good customer service and facilitate the handling of contacts. Mark-sensed tickets are larger and more bulky, which creates a filing problem. One way may be to trim the ticket to regular toll ticket size. Another alternative is to retain the mark-sensed tickets in a centralized point and furnish information to the commercial personnel when requested.

Left to right: Tom Laming of Tonganoxie, Kan.; William Holt of Milan, Mo.; B. R. Barger and William C. Harris, both of Lexington, N. C., and Henry Sheve of Rochester, N. Y.

There are definite advantages in having the mark-sensed toll tickets interpreted in the accounting operations, especially if customers use an extensive number of toll calls monthly. If mark-sensed tickets are to be forwarded from the local exchange to a centralized point for billing and later returned to the commercial office for reference purposes, it is necessary to secure appropriate mailing containers. The transportation of mark-sensed tickets is more costly and inconvenient than is experienced with the present type of ticket. Arrangements should be made with the public information department for bill inserts which should inform the subscriber that he is to receive a new type of toll bill and local service statement.

The accounting department is certain to inherit its share of problems in this program. Basically, the mark-sensed card must be designed to provide the same information as does a 1A ticket. It contains mark-sense positions for the operator to record the originating station, the class and type of call, the conversation time and some means of recording the terminating point.

Two methods are most commonly used for the later, the first being to have the operator mark the area code as well as the CO Alpha designation. The second method is to assign mark-sensing positions to the most frequently called points and provide for key punching those points which are not listed on the card. Some 55 terminating points can be shown on any given card and this number will provide for an extremely high percentage of calls from any toll center.

Most of the cards presently in use also contain a facsimile of a 1A ticket as a part of their make-up. This provides the toll operator with space to record any information such as credit card numbers, third party, Enterprise, etc. The card must, of course, also contain card column assignments as well as interpreter headings.

Next, I would like to discuss with you the procedure followed by the revenue accounting section. The cards received from traffic are first processed through a punch equipped to read mark-sensing. With this step the data can be emitted into each card as it is punched. The cards are then sorted to determine if they require any manual punching as to terminating point. They are then sorted behind a master rate card by originating point. This master card contains the following information:

(1) Place called.

(2) Basic and overtime rates (Day and night).

(Please turn to page 147)

Left to right: John Martin of New Holland, Pa.; J. K. Stoltzfus of Birdsboro, Pa.; Mrs. Bertha B. Eaby of Ephrata, Pa.; James Murray of Birdsboro; J. H. Blair of Ephrata, and Amos Hartz of Birdsboro.

Regulation and Accounting

*By JOHN F. DONOVAN**

(An Accounting Conference Address)

IN CONSIDERING the topic for this discussion I have undertaken to approach the subject in the following manner.

First, I shall discuss certain aspects of accounting as it relates to the public utility industry; and, second, I shall present some discussion on the correlation of utility accounting to utility regulation.

In the remarks that follow, I shall refer to utility accounting as prescribed by a public utility regulatory body or office as "regulated accounting," in contradistinction to accounting methods or forms unprescribed by a governmental regulatory agency.

Turning to the subject of regulated accounting, as it affects telephone utilities, it appears advisable to start the discussion with an outline of the basic reasons why business enterprises, both regulated as well as non-regulated, maintain accounting records. In my opinion such basic reasons are three in number and include the following:

First, development of the financial data which management may require or find useful for operating the company on a profitable basis. Ordinarily, this places special emphasis on the development of cost detail by products or operations, or gives special consideration to the peculiarities of the company or the territory it serves in order that management may expand operations in its profitable fields and modify or eliminate operations in others.

Second, the development of operating and financial data which will meet the minimum requirements of full disclosure for use by stockholders, bondholders, security analysts and such governmental agencies as the Securities and Exchange Commission.

Third, the collection of operational and financial data in such form as to permit the development of information required to be reported in income and other tax returns in accordance with the rules and regulations of the Bureau of Internal Revenue and other taxing authorities.

Having established, for the purposes of this discussion, the basic reasons why business enterprises maintain accounting records, it appears appropriate to ascertain the extent to which the regulated telephone company can attain these objectives through regulated accounting and to compare the results achieved with those of a non-regulated industrial company.

As an observation, I am sure we are all aware that the accounting practices of the regulated utility company, because of the fact that it is required to use prescribed accounts not necessarily of its own choosing, must differ somewhat so far as the requirements of management are concerned, from those prevailing in the non-regulated field of industry.

This poses the question: Is management of the regulated industry, so far as accounting intelligence is concerned, as well informed on operating results and financial matters, as management of the non-regulated industry?

Telephone companies, as well as other regulated companies, are required to account for their varied financial transactions in accordance with a system of accounts prescribed by a governmental agency. Bearing in mind that such companies are required to render services to all located within their dedicated area who request service, it could be presumed that the telephone utility is not primarily concerned with the development of accounting data which might be useful in expanding operations in profitable areas and curtailing operations in others. From this fact, one could conceivably arrive at the opinion that the records maintained by telephone utilities might not provide management with the information it necessarily requires to conduct operations on an efficient and profitable basis.

Such is not the case. While it is true that telephone utilities may not establish their own system of accounts, but must use those prescribed by a regulatory body, such a requirement places management in possession of certain valuable tools.

Because of accounting standardization, management has available current financial and operational data from its own records which it may compare with that of other telephone companies. It has functional cost detail in its accounts which facilitates the negotiation and operation of settlement contracts with other companies. It is in a position to present its financial and operational data to a regulatory agency in a form most useful to that agency, and with a minimum requirement of review and analysis of its records. I believe that the accounting records of the telephone company, if properly maintained, can and do meet the standards which I have set forth as the first basic reason for the maintenance of accounting records.

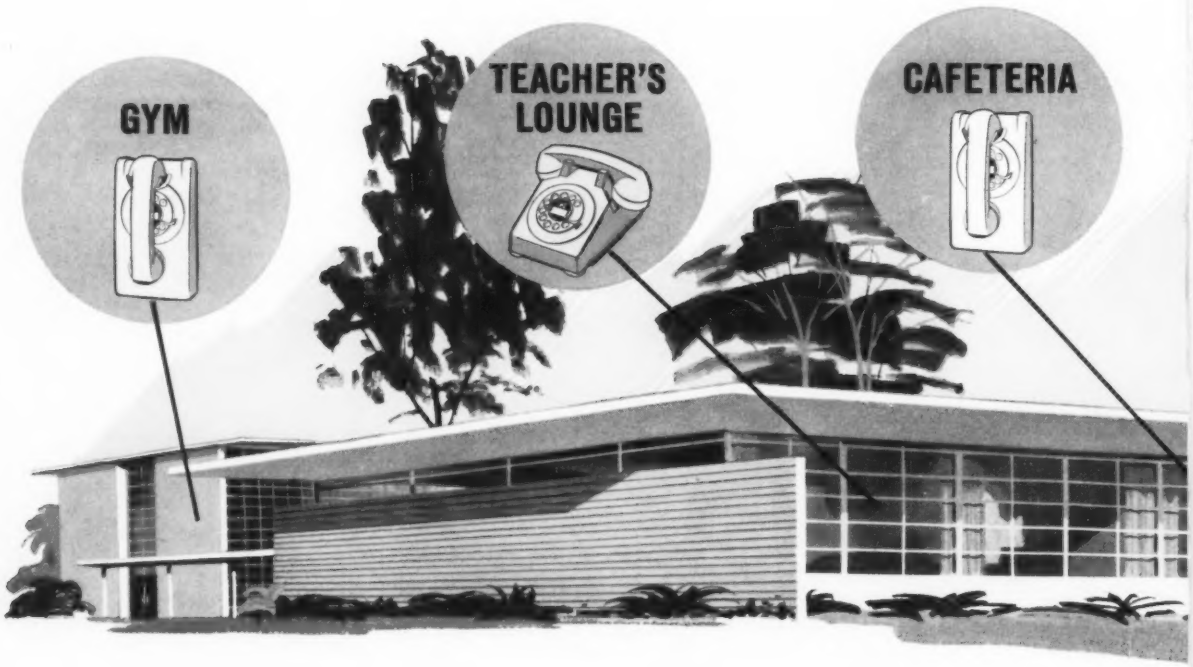
Turning to the second basic function of accounting—the development of operating and financial data which will meet the minimum requirements of full disclosure—I believe the regulated utility, because of its imposed use of a prescribed accounting system, finds it relatively easier to meet the mandate of full disclosure. Thus in this respect the regulated company appears to have a possible advantage over the non-regulated company.

Let us consider the third basic objective of accounting—the development of data to meet the information requirements of the Bureau of Internal Revenue and other taxing authorities. In commenting on the effect which regulated accounting may or may not have in assembling tax information, I should like to ask you this question. Is there a system of accounts or accounting, disregarding a business of relatively small proportion, which falls naturally into the format of the federal income tax return and simultaneously affords an ideal pro forma financial picture for use by the management of any business —regulated or unregulated? Although

(Please turn to page 50)

*Mr. Donovan is Assistant Director, Division of Finance and Accounts of the California Public Utilities Commission.

Kellogg Color Phones Fit In



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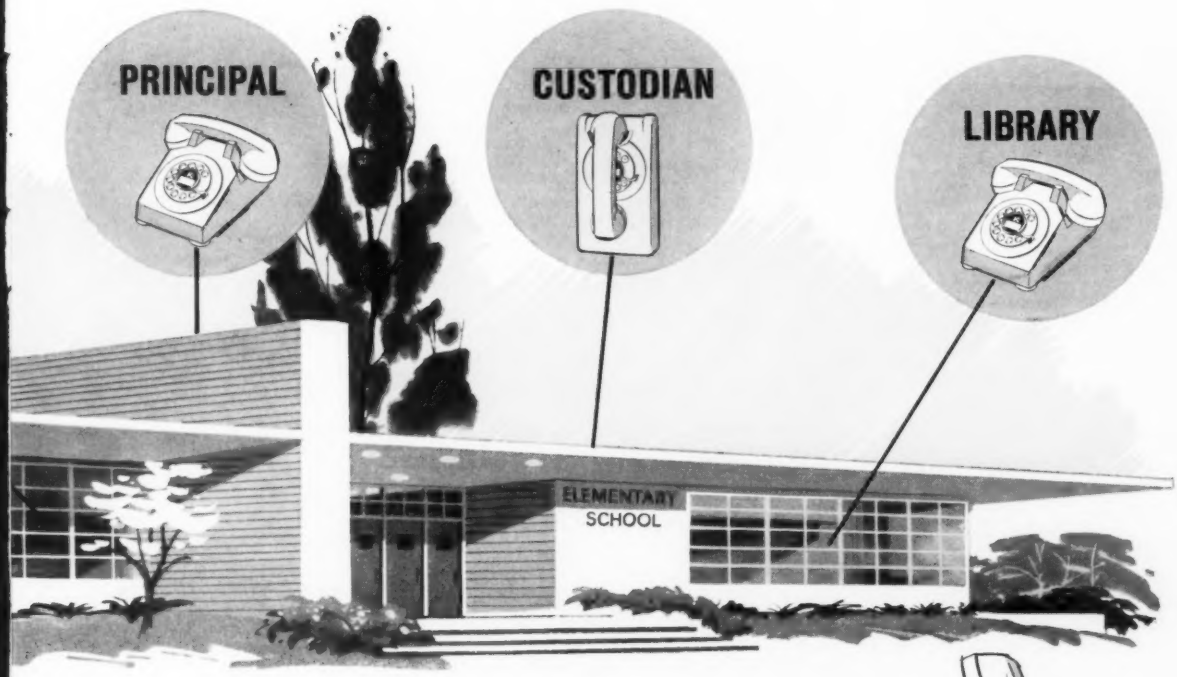

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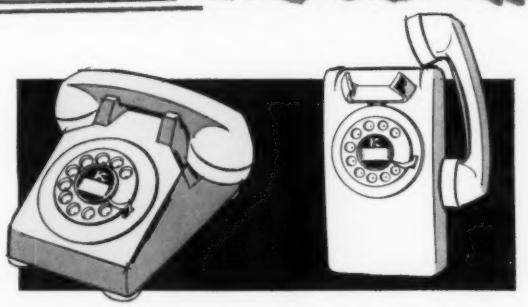

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this may appear to be a defensive approach, I believe we will all agree that the gathering of information for a federal income tax return involves a considerable amount of paper work to provide reconciliation between the data recorded in the books of the company and that reported in the income tax return, whether or not the business or its accounting is regulated.

I have noted that some of the telephone companies operating in California are experiencing what appears to be a rather burdensome problem in tax return preparation. This problem is partly due to regulation, but an equally contributing factor is management's election to use accounting practices for tax purposes which differ from those required under the prescribed accounting system.

In this connection I have in mind the situation which arises by reason of the fact that telephone companies record certain charges as plant additions on their books while at the same time reporting these charges in tax returns as a deductible expense. This conflict between the accounting practices followed by the telephone company for financial purposes, and those used for tax purposes, tends to create a condition of confusion and can result in the preparation of financial statements which are somewhat misleading. Under the conditions stated, the accounting records do not reflect the tax expense associated with recorded earnings.

In some cases, the difference in net profit per books and per tax returns is sufficient to cause the payment of dividends out of capital and to required outside accountants who audit the books to footnote the certified financial statements. It would be ideal if utilities could operate under a single standard so that recorded net income is associated with the expense allowance for taxes on income.

To conclude the discussion on this third point, let me say that I do not believe that regulated accounting itself imposes a relatively greater burden on the regulated utility for the purposes of income or other tax reporting, than is the burden attendant in the instance of an unregulated industry of comparable size, which, have the freedom to design its accounting to suit its individual needs, most likely would not adopt the income tax form as an ideal for its own purposes.

Now, broadly referring to all the objectives of regulated accounting:

Is there any undue burden imposed by regulated accounting in comparison to unregulated accounting? Or rather is not the burden of regulated accounting offset to some extend by the frankness of accounting data made available for the benefit of individual members of the industry?

Left to right: Homer Joy of Streator, Ill.; Mrs. Joy; Mrs. F. G. Tatman, Mrs. K. J. Boshart, Mr. Boshart, and Della Wilcox, all of Lincoln, Neb.

I believe this is true. At least, I can say that it is the endeavor of the California commission's financial staff to assist, rather than to hamstring the telephone industry, by means of regulated accounting procedures.

While opining on the aspects of regulated or prescribed accounting, let us reflect for a moment on the regulatory procedures by means of which these systems — particularly the telephone system—are derived.

It has generally been the policy and practice of the California commission, before the adoption or modification of any prescribed accounting system, to initiate hearings, with due notice, for the opportunity of expression of opinions and suggestions, within the industry affected.

Left to right: Morris Burton of Tyler, Tex.; Virginia Hirsch of Mountain Home, Ark., and Berney Simner of St. Louis, Mo.

I believe it is fair to state that, in California, a finally-adopted system, or a modified system, within practical limits, is reasonably sensitive to the needs of the industry, whatever they may be, as well as to the requirements of the commission.

I must admit that, on this point of accounting system-adoption, the procedures have been different for the telephone utility industry. In this case our commission adopted, subject to minor modifications, the FCC system for Class A and Class B telephone companies. That adoption was not a matter of expediency, however. In this instance it was our feeling that to deviate would not be advantageous for a number of reasons including the fact that certain of the companies operating in California are under the accounting jurisdiction of the FCC.

With regard to Class C telephone companies, which, in California includes those companies whose operating revenues range from $1,500 to $100,000 annually, a Class C system was devised, after diligent consideration by the staff, of the needs of the individual companies affected.

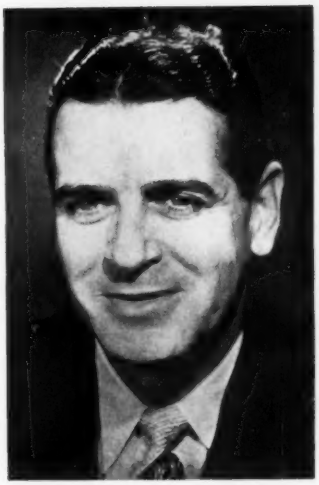
As evidence of this consideration, I might point to the inclusion in the California Class C uniform system, of certain account titles which will assist the utility in meeting the accounting requirements for REA financing.

May we conclude, then, that as a practical result, regulated accounting, and specifically regulated telephone accounting, includes and provides, to a considerable degree, what would have been devised, ultimately, by the industry severally. To have accomplished this by a governmental agency, in cooperation with the industry, may have expedited the evolution to our present forms and procedures.

Now, let us turn our attention to the second part of this discussion: The

(Please turn to page 130)

You're Selling—So What?



*By R. PARKER SULLIVAN**

(A Commercial Conference Address)

THERE IS a good possibility that when you read the title of this talk in your program it may have led you to believe that I was appearing here this morning with some question in my mind as to whether a selling program for an operating telephone company is really worthwhile. While there are still some people in our industry who are undecided on this question, let me assure you that I am not one of them. On the contrary, I not only believe we should have an active, efficient and aggressive sales program, but I sincerely question if we can properly fulfill our responsibility to the public, our shareowners and our employes if we do not have an organized sales effort as a part of our daily operation.

Any question concerning this matter was completely dispelled when I analyzed the results of a recent marketing and merchandising test that we conducted in a community with a population of approximately 7,000. Here are just a few of the statistics that I selected from the results:

One sale was realized for every three contacts by the sales people; a total of 36 different items were sold—among them were 83 extensions, 112 upgrades, 77 colored sets, 34 extra listings in the directory, 20 loud-ringing bells or industrial horns, 11 Electronic Secretaries, seven loud-speaking telephones, five sound-booster telephones, nine switch keys, two wiring plans, and a variety of other products and services. More than 85 per cent of the 1,436 customers contacted expressed personal appreciation for the opportunity of seeing what was available and for having the counsel and recommendation of purchase from our representative.

These results show very clearly the following:

(1) The sales effort was well received by the vast majority of our subscribers.

(2) There exists a real need and a very strong desire among our customers for a great variety of our products.

(3) Our customers are ready, even anxious, to have an opportunity to apply their imagination to the benefits that they might realize from the different goods and services that we have available for them.

(4) Our subscribers are quite willing and able to buy a number of the communication extras that in their opinion enhance the value of their basic service.

In addition, these results represent a very convincing answer to the skeptical statement, "You're Selling — So What!"

It seems to me that the presence of a sales program as an integral part of a telephone company's daily operation should be considered as a necessity rather than an option. This conclusion was reached only after a considerable amount of mental gymnastics, the results of which were so completely convincing to me that I thought I might pass them along to you for your consideration.

I am confident that you will agree with me that telephone service is no longer considered by the general public as a luxury or merely a convenience, but rather it has developed to the point where, today, it is thought of as a vital necessity in our nation's social, political and economic life.

Analyzing this transition, you are brought to the full realization that the general concept of "good telephone service" is, today, far removed from that of 20 years ago or even 10 years ago. In years past, we accepted the request for service from a customer and provided it to him in most instances through a single black instrument, and over a line shared with other people. We supplied him reasonably good maintenance, as well as fairly fast and accurate day-to-day connections over these facilities. This was generally conceded at that time to constitute good telephone service.

However, providing telephone service in this age of jets, missiles, computers, miracle drugs and other scientific marvels, each of which is designed to provide man with more comfort, more convenience, a better way of life and a higher standard of living, must of necessity constitute something other than just furnishing the basic elements to allow telephone communication between people.

To meet the pace of this push-button age, our industry the same as others is required to develop many new and improved products, provide more and better service, devise more economical means of furnishing and improving service to more and more people. We are meeting this responsibility, in part, through our laboratories and manufacturers.

However, the true value of these discoveries and developments to the telephone user is in direct relation to how well we in the operating companies fulfill our responsibility of acquainting the public with them and assisting the telephone subscriber to understand them, thus enabling him to adapt these improvements to his everyday communication needs and desires. The most effective, proven way to fulfill this obligation to the public is to establish a comprehensive sales program, one that will provide for adequate exposi-

The report of the USITA Commercial Committee Chairman K. L. Lawson will be published in a later issue.

*Mr. Sullivan is Vice President-Merchandising of General Telephone Corp., New York City.

tion, demonstration, consultation, and solicitation and to furnish it on a continuing basis in such a fashion that it reaches all areas of our operations and all age groups of our society.

The realization that we no longer have a choice concerning the establishment of a sales program, but rather that we are confronted with the very serious responsibility to furnish it as a part of our service offering is the real justification for the time we are devoting to this subject this morning.

I have on numerous occasions discussed sales programs with many of you, and the result of such discussions has led me to believe that some of your doubts and hesitations concerning the adoption of an active, aggressive sales program stems from a fear that such a program naturally implies a certain amount of "high pressure" techniques, extensive use of "gimmicks" or gadgets and possibly some grossly exaggerated claims concerning our goods and services.

In the event you entertain such fears, let me hasten to assure you that such things are not consistent with my idea of a good telephone sales program, but rather I would view them as being intrinsically contradictory to our industry's basic principles.

We in the telephone business enjoy a unique position in the market place today. To the public we are the communication experts and the only real communication experts in the field, and they place their complete confidence in us to provide the facilities and services that are required for complete, convenient, tailor-made, modern communications.

This enviable position in the market carries with it a very serious responsibility, that of designing our sales effort so that our contacts with the public will not only justify their faith, but assure the continuing of such confidence. Our position can be seriously jeopardized should we resort to any form of trickery or deceit which would result in confusing or misleading our customers.

Left to right: Gene T. Whitlock and T. C. Thomasson, both of Lancaster, S. C.; R. J. Fegan and T. B. Fegan, both of Junction City, Kan.

Let's not kid ourselves, however. We can't expect to sell much of anything unless we tell the public about it, show it to them, promote its advantages and ask them to buy it. This is elementary to the successful sale of any commodity, but this doesn't necessarily imply high pressure selling. These basic ingredients are present in all sales programs, but the manner in which they are used determines the type of sales effort that it is. It is somewhat similar to the use of our language.

For example, the title of this talk, "You're Selling—So What," can have completely different meaning depending upon where you place the emphasis and the inflections or overtones that you use. Emphasis on the first word and a questioning tone and you express surprise and curiosity. Emphasis on the last two words and a belligerent tone and you express a desire for an argument. This same thing is generally true of your sales program.

The public will classify your sales effort as high pressure or individual consultation selling depending upon the emphasis you place on the different phases of your program and the inflections and overtones that you give to your employes in their training. Proper emphasis and good overtones will assure you good reception from your subscribers. They will consider it an additional service that you are offering and be appreciative to you for having made it available.

A sales program designed to provide adequate time for customer consultation, to determine over-all communication requirements, and one which provides the customer with a package that will best suit his individual needs, supported by all the technical knowledge and experience that is available in the company to assure satisfactory service, in my opinion is a sound program basically consistent with the principles of our industry.

Some of you have expressed your concern that there may be a conflict when an aggressive sales program is introduced into the operations of an industry that since its very inception has been basically service oriented. Rather than visualizing a conflict, it appears to me that one is an essential part of the other, or one complements the other. It is questionable in this day and age whether we can provide "good telephone service" unless we actively canvass our market, consult our customers, determine their wants and fulfill them with products and services that they desire.

If we leave to the customer the responsibility of finding out for himself the various products that are available and to determine whether or not they can be used for his convenience, we are not entitled to the confidence that he places in us and, in my opinion, we are failing to live up to our claim of

(Please turn to page 148)

Left to right: T. C. Woods Jr. of Lincoln, Neb.; Tom Deere of Cleveland, O.; B. J. Sievers of Lincoln; Kathryn Journey and Elizabeth Journey, both of Higginsville, Mo.

New Equipment

DEVELOPED FOR

THE INDEPENDENT TELEPHONE INDUSTRY

Fall Showing by

COOK

- THE IMPAK POWER TOOL LINE
- 3C PROTECTED TERMINAL BLOCKS
- SPLICE COAT & CABLE COAT
- COOK BATTERY CHARGER
- HI-FI LOADING COILS
- BD TERMINAL for underground plastic cable

IMPAK

GENERATORS, PUMPS, BLOWERS, CABLE CUTTERS AND POWER TOOLS

IMPAK VENTILATORS

Portable centrifugal blower, equipped with ⅓ H.P., 115 volt, 1 phase, 60 cycle motor, with either 6″ or 8″ hose adapter, carrying handle and cord.

PERFORMANCE DATA IN Cfm. AT VARIOUS PRESSURES

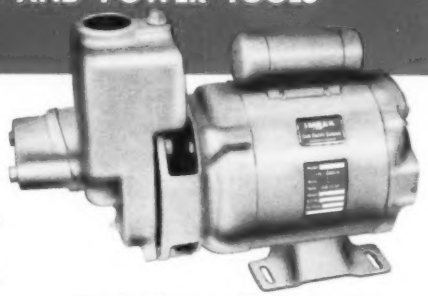
Size	RPM	Wheel Dia.	Static Pressure in Inches 1/8	1/4	3/8	1/2	5/8	3/4	7/8
B12	1725	6-1/4	611	573	535	495	457	411	345

IMPAK PUMP

Self-priming centrifugal, with 1 H.P. heavy duty NEMA Approved motor, and bronze impeller with non-clog features.

RATING TABLE

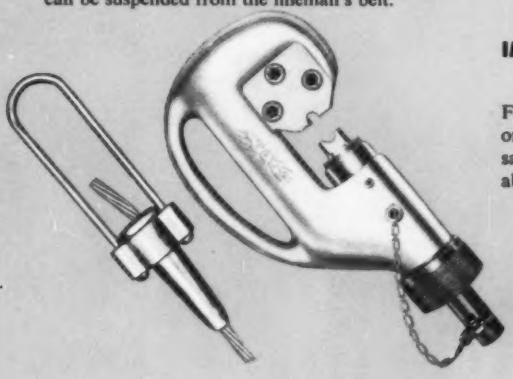
Pump Model Number	Motor H.P.	Suction Size	Discharge Size	Height of Pump above Water*	Discharge Head in Feet* 5	10	15	20	25	30	35	40	45	50	55
					Capacities in U.S. Gallons per Minute										
ESP-100	1	2″	1-1/2″	5′	90	88	86	83	79	74	66	58	48	35	22
				10′	87	85	82	78	72	66	58	48	35	22	
				15′	82	78	76	70	65	58	48	35	22		
				20′	77	75	68	64	56	46	34	21			
				25′	73	66	62	54	46	33	20				



*Heads include normal friction loss. For total head in feet add height above water to discharge head in feet.

IMPAK CARTRIDGE TYPE CABLE CUTTER

A tool designed for operator safety, that will cut cable and wire up to ⅜″ diameter and will operate safely in any attitude or position. Impak cable cutter is a lightweight and economical tool that can be suspended from the lineman's belt.



IMPAK No. 726 ELECTRO-PNEUMATIC ROTO-HAMMER

For percussion drilling and hammering in masonry or concrete, this entirely new mechanism is a time saver for all types of construction or repair. Available in 115 and 230 volts.

No. 605 & 606 IMPAK CHAIN SAWS

For quietly felling timber, limbing, cutting heavy beams or any heavy lumber at the pole. Model 605 for cutting up to 14″ and 606 up to 20″. Both models require 1500 watt Impak Power Generator.

No. 824 IMPAK WRENCH KIT

Includes No. 823 Impak wrench, a universal joint, a 3″ extension bar, 6 hexagon sockets ½″ to 13/16″ in 16ths, all packed conveniently in a compact sturdy steel case.

IMPAK AC POWER GENERATORS

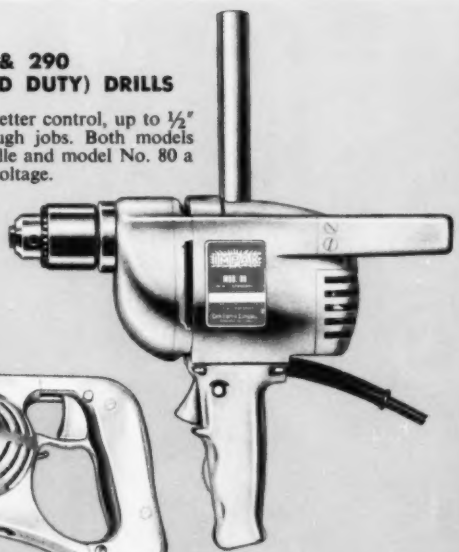
The only complete line of mobile generators available with wattages of 1000, 2200 and 3500 for 60 cycle single phase AC power. Impak 3 phase 60 cycle generators are also available at 2700, 4000 and 5000 watt ratings. A perfect power source when electric lighting, tools and equipment are required to operate remotely at the pole.

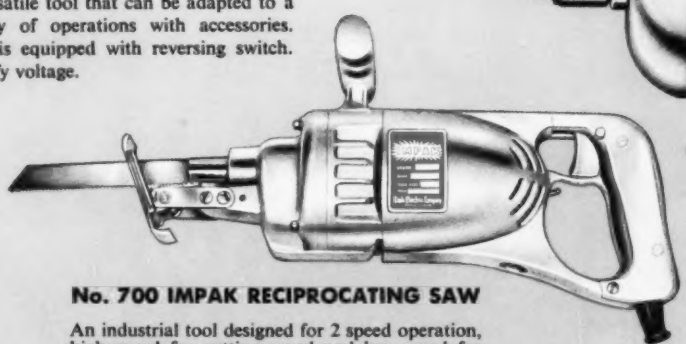
No. 823 IMPAK POWER WRENCH

A versatile tool that can be adapted to a variety of operations with accessories. Unit is equipped with reversing switch. Specify voltage.

No. 80 & 290 IMPAK (STANDARD DUTY) DRILLS

For easier handling and better control, up to ½" fast drilling on really tough jobs. Both models have detachable pipe handle and model No. 80 a reversing switch. Specify voltage.



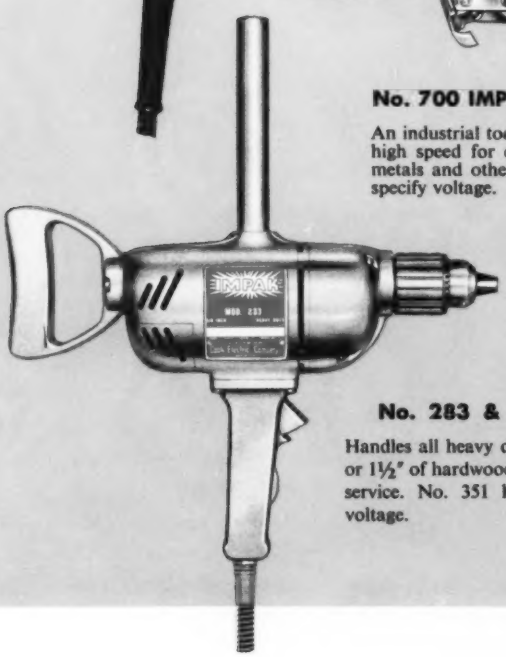


No. 700 IMPAK RECIPROCATING SAW

An industrial tool designed for 2 speed operation, high speed for cutting wood and low speed for metals and other hard materials. When ordering specify voltage.

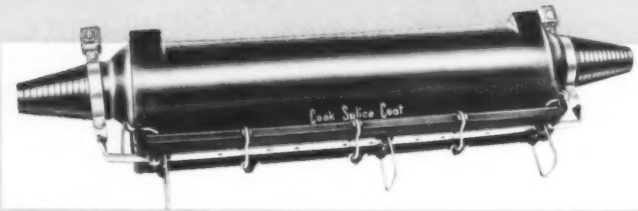
No. 75 IMPAK ¼" HEAVY DUTY DRILL

An excellent tool for all types of general utility and installation jobs. Standard speed is 1800 r.p.m. Specify voltage.



No. 283 & 351 IMPAK DRILLS

Handles all heavy duty drilling up to ½" of steel or 1½" of hardwood. A quality built drill for long service. No. 351 has reversing switch. Specify voltage.



COOK SPLICE COAT

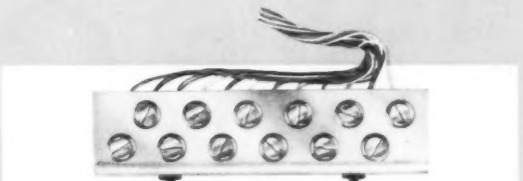
A neoprene unit designed to eliminate the need for taped splices on cable sizes from 1.1 to 2.2 inches in diameter. Protection of pairs can be added by using Cook 3C protector blocks.

COOK CABLE COAT

A versatile, accessible, easy to install neoprene covered unit for making taps on cable up to 1.2" diameter, and for taking off subscriber drops and protecting selective pairs with Cook 3C protector blocks.

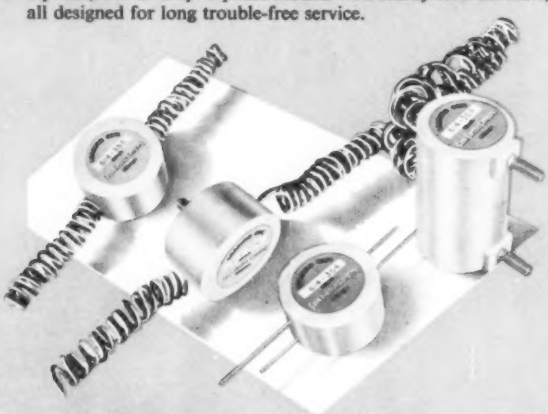
COOK BATTERY CHARGER

A new battery charger furnished in 12 amp. 1 phase, 24 amp. 1 phase, and 25 amp. 3 phase models with sturdy steel cabinets, all designed for long trouble-free service.



COOK 3C PROTECTOR BLOCKS

These versatile units are used for terminating and protecting cable pairs selectively by inserting Cook Minigap arresters. Furnished in 3, 6 and 16 pairs, combinations of 9 and 12 pair can also be used for terminating cable.



COOK HI-FI LOADING COILS

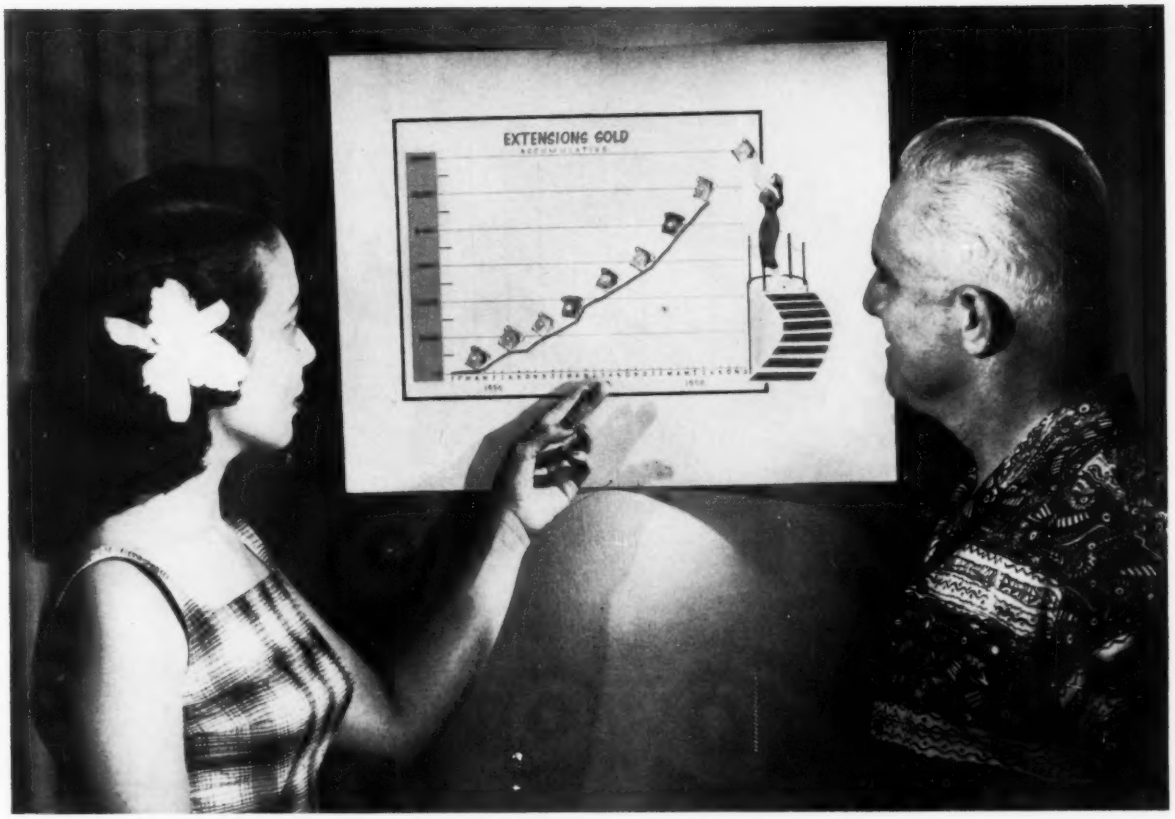
Cook Hi-Fi loading coils reduce attenuation, combat frequency distortion and avoid cross talk on existing lines. These coils save installation costs by permitting use of smaller gauge line wire.

COOK BD TERMINAL
(for underground plastic cable)

A mounting, terminating and distribution point for underground plastic cable. This terminal can be furnished with Hi-Fi Loading Coils and 3C Terminal Blocks. Specify requirements when ordering.

COOK ELECTRIC Company
Since 1897

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS



General Commercial Manager W. C. Kea, and Service Representative Shirley Scott of Hawaiian Telephone Co. view chart showing the accumulative number of extension telephones sold by service representatives since 1956.

Business Office Selling —Hawaiian Style

*By WILLIAM C. KEA**
(A Commercial Conference Address)

THREE YEARS ago when I was here, I had the good fortune to attend a three-day conference on "selling color" which was being held in this city. As a result of what I learned here and in other parts of the country, I became very enthusiastic about merchandising. Soon after my return to Honolulu, we decided to appoint a merchandising director and embark on a program of selling and better servicing.

As part of our over-all merchandising program, we, in commercial and particularly in the business office, realized that we had many opportunities to sell extensions, upgrades, extra listings and numerous other miscellaneous items of service. Selling these items, as you know, represents but one portion of a complete merchandising program. I am sure you have found that there are many facets to merchandising as we know it today. In order to create greater customer desire for our service, we must develop good public relations, we must have the type of service available when it is wanted, and our prices must be right. To be successful in meeting these merchandising objectives requires the coordinated effort of people in all departments of the company.

One of the primary objectives in our commercial operations is to devise ways and means for developing additional revenue to counteract the ever-increasing cost of doing business. For this reason, I'm sure that all of you appreciate the importance of an active business office sales program directed pri-

*Mr. Kea is General Commercial Manager of Hawaiian Telephone Co., Honolulu.

marily at the sale of the second, third and fourth telephones in the home.

Gave Color Training

In 1956, we instituted a vigorous promotional campaign in keeping with the new merchandising look. To begin with, we offered color training to our service representatives. We found color to be a fascinating subject and our people went for it in a big way. We showed charts and explained why certain colors are warm, some cool, and others neutral. Our service representatives appreciated this phase of their training and learned that selling color could be fun—when they had time. We also trained our people in recognizing opportunities for selling additional telephones—when they had time!

"When they had time." I think this phrase summarizes the chief fault of the early part of our new sales promotion. We soon learned that to do a good sales job we had to provide the time required. Through experience we found that an average of four minutes was required for each sales attempt. To meet this requirement we had to increase our work force, an added expense which we have been successful in offsetting many times over by the resulting new revenue.

"When they had time." This phrase also implies that sales effort is of secondary importance. It is just as much a part of the job as getting such pertinent information as the correct address or quoting the appropriate charges. In employing new service representatives, we test the applicants for sales aptitude.

Service representatives of the Hawaiian Telephone Co. who were business office sales leaders during August. Average sales per service representative amounted to $1,390 in new annual revenue. The girls are wearing muumuus, the Hawaiian version of the chemise.

We also learned that in order to direct effective selling, it was essential that our first line supervisors be thoroughly acquainted with sales techniques and that they be competent sales people themselves; this is vitally important.

To summarize, we found that:

(1) It is necessary to provide time for an adequate sales job.

(2) Selling must be accepted as part of the job.

(3) Supervisors must be competent sales people.

With these essentials in mind, our training supervisor developed a training outline and then tried it on herself. She took regular customer calls and handled them in the prescribed manner. By making a number of sales, she proved to herself that the new techniques really worked.

Used Training Film

A training film which depicts vividly the telephone needs in a typical American family was used. Through this movie we learned that customers are not aware of the inconvenience of having only one telephone. Floor plans of the homes shown in the movie were studied and telephones were proposed by the students for areas where members of the families lived, worked, and slept. The question, "What do we mean by complete, modern telephone service?" was being answered. Another movie was then shown which depicts a typical service representative who has had sales training, but has difficulty in applying what she learned. She experiences many problems such as not obtaining sufficient facts about customers' homes and the users of the service. With the aid of her supervisor she overcomes these selling obstacles and is successful in convincing the customers that they should have adequate service.

Pictures of Honolulu service representatives are mounted on a replica of a dial to give recognition to sales leaders.

We then presented an accelerated program to all business office supervisors above the first line level. This particular session was designed to develop attitude rather than techniques. It lasted the better part of a day and we were successful in gaining support of the unit managers and staff members who were to follow the sales program as it progressed.

We next set up a comprehensive training program for our first line supervisors. We allowed four days for each class and programmed the training sessions on a continuing basis. We made certain that these supervisors developed into competent sales people —and we had them spend the final day of the course taking customer contacts and putting into practice the training which they had received. Again it worked. Results were good and the enthusiasm was high.

As the supervisors completed their training they in turn instructed their respective groups of service representatives.

Four-Step Sequence

A sequence list was developed for use by the students while taking applications for new service or moves of service. This list was built around the four basic steps to selling: (1) Fact finding, (2) making recommendations, (3) answering objections, and (4) closing a sale. We did not let a service representative leave the classroom and return to her position in the business office until she had successfully handled actual customer contacts from the classroom.

Then came the all important job of follow-up. We carefully watched each group of representatives as their training was completed. We found it essential that each supervisor check continuously on the sales opportunities and results of her people.

Many sales opportunities are presented to service representatives on incoming calls. We found that even inquiries about bills and long distance calls presented sales opportunities. One of our service representatives made a sales opportunity out of a complaint concerning the non-delivery of a new directory. She expressed regret, arranged for a telephone book to be sent out immediately and turned the contact into a friendly discussion of the customer's telephone usage. She sold an extension. In another instance, when a customer called to complain about receiving nuisance calls at night and stated that he had to get out of bed and walk downstairs each time, the service representative sold him an extension for his bedroom, thus making his inconvenience more convenient. We have found that approximately 50 per cent of the incoming calls to the business office can be turned into sales opportunities.

Left to right: P. L. O'Neill and D. J. White, both of Fairfield, Ia.; J. B. Haley of Austin, Tex.; LaMar S. Stoops of Nappanee, Ind.; and Francis X. Welch, TELEPHONY's Washington editor.

"Initiated" Selling

We were not satisfied with only the opportunities offered on incoming calls, so in June of this year, we set up a special team of three representatives who are doing "initiated" selling. This team has been calling customers about upgrades and extra listings, and has used these contacts for developing complete service needs. Many sales have resulted. During August, each girl sold an average of $147 per day in new annual revenue.

We are able to look with considerable pride at the results which our service representatives have accomplished since 1956, when our current merchandising program started. We are pleased to report the following:

(1) Annual revenue sold has amounted to $318,197. Sales each month are currently amounting to approximately $30,000.

(2) Our service representatives sold 9,007 residence extensions and are currently selling over 500 per month—an annual rate of 6,000. Residence extension development has increased from eight extensions per 100 residence main stations at the start of 1956 to our present development of 14.

(3) Other accomplishments include the sale of 1,240 extra listings, 11,943 colored instruments, 3,526 upgrades, and we have saved 1,048 disconnects.

Our people have done more than increase revenues. They have given our customers the best service which we could offer. They have visited by telephone thousands of homes and offices counselling and planning—designing a service for each individual, as they listened to complaints, explained bills and gathered helpful comments. And, in doing this, they have added new interest to the business office job and given all concerned a highly satisfying feeling of worthwhile accomplishment.

Although we are gratified with these results in terms of better service and increased revenues, we view the future with even greater enthusiasm as we look forward to being the 50th state of the Union.

Left to right: F. J. Cristich of Monrovia, Cal.; L. V. Ford of Brownwood, Tex.; E. C. Weitzell of Washington, D. C.; A. B. Walrath of New York City, and John Orr of Belle Meade, N. J.

Adequate Earnings—Regulatory Considerations

By P. A. NENZEL*

(A Commercial Conference Address)

INDEPENDENT telephony is growing up. Yes, Independent telephony is growing up. In the past decade plant investment in the Independent telephone industry has increased from 829 million dollars in 1948 to 2.76 billion dollars in 1957, or 3.3 times.

With this growing-up have come many problems, not the least of which is the maintenance of adequate earnings. In this growing-up process, many of our companies have had to go to the public for money, particularly equity, whereas, in prior years most of our funds were obtained from borrowing, internal sources, and our private investments.

Bringing the public into our companies has created for us a responsibility for maintaining adequate and stable earnings if we expect to fulfill our obligation to these outside stockholders and if we expect them to continue to furnish us with ample funds. Adequate earnings in these inflationary times can be obtained only through economical operation and periodic repricing of our services.

It is this latter phase which is to be the subject of discussion in this paper.

A review of the operating results of Independent telephone companies reporting to the USITA shows that the per cent earnings on average capitalization was 6.5 in 1953, 6.4 in 1954, increasing to 6.7 in 1955, maintaining this rate in 1956 and then declining to 6.3 in 1957. Likewise, the per cent earnings on average common equity was 10.78 in 1953, 10.30 in 1954, increasing to 11.04 and 11.00 in 1954 and 1955, respectively, and then declining to 9.2 in 1957, whereas, the Bell System, which earned the same return on average capitalization as the reporting Independent telephone companies in the years 1955 and 1956, was able to maintain this rate of earnings through 1957. The conclusion to be drawn from these statistics is that the Independents have not moved sufficiently rapidly in seeking a repricing of their services or have not sought an adequate return.

We must all realize that those of us who are dependent upon the financial markets for money are in competition not only with each other and other public utilities, but industry in general and, consequently, if this trend in earnings continues there is only one inevitable answer and that is our service is going to deteriorate as we are not going to be able to meet public demands.

Now, what can we do about it? First, we should maintain earnings records on a moving 12-months ended basis so that we can see trends develop. Earnings should also be projected for at least 12 months into the future. Regulatory lag, which to a degree appears inevitable, can be overcome to some extent by being able through forecasting to anticipate some time in advance any rate relief that will be needed.

Assuming we have anticipated sufficiently in advance a projected decline in return and have made appropriate filings for the repricing of our services, our next job is to show the regulatory body what has taken place since our last rate proceeding in the way of attrition.

The term "attrition" has come to have common usage to express the decline in rate of earnings caused by inflation. It has been defined many times in papers on regulation and in commission decisions. A recent decision of the Maryland commission expresses the effect of attrition very well and at the risk of redundancy I will quote from it:

"Attrition is the lessening or diminution of a rate of earnings caused by and resulting from the addition of investment in plant at a cost higher than the cost per unit (telephone) at the time rates were last established. It results directly from the fact that additions to plant at higher than average unit cost produce a new unit cost greater than the old while the rate of return is related to, but not established upon, the old cost per unit." (Re Chesapeake & Potomac Telephone Company of Maryland, 22 PUR3d 321.)

The demonstration of the actual effect of attrition is not as simple as its definition; consequently, some commissions have refused to recognize its operation, usually because the utility has not made an adequate showing. Sometimes its operation has been obscured by temporary offsetting economies such as those resulting from automation. The method of meeting the problem has also varied. Some states have used a period-end rate base; others have made allowances in the rate of return and recently in a New Jersey decision the commission added a flat percentage to the rate base. However difficult this phenomenon is of demonstration, or by what method it is met, does not minimize the fact that an adequate allowance for attrition is extremely important, particularly in those jurisdictions which use a past test period. Even in those states which use a future test period this element can have a considerable bearing on the length of time an adequate return may be maintained for the future.

A look at the statistics of the reporting Independent telephone companies tells us why. The average plant per station has increased from $222 in 1953 to $290 in 1957, or 33 per cent. But that is only part of the story. In 1957, net additions to plant for each telephone gained was $634, whereas, the average net additions per telephone gained for the preceding four years was $439. It is perfectly obvious that rates based on a plant cost of $290 per station cannot long maintain a rate of return when net additions per station gained are running at more than twice this amount.

We are currently in a unique situation, to my knowledge never heretofore experienced, where we have inflation and a recession at the same time. That the inflationary spiral which we have experienced during the past 10 to 15 years is going to continue is practically a certainty. Many industries are still making labor contracts extending over a period of three to five years with built-in wage adjustments as well as other costly fringe benefits. Social Security taxes also have been increased again. Therefore, we must anticipate facing annual wage adjustments and

*Mr. Nenzel is Vice President and General Manager of California Water & Telephone Co., San Francisco, Cal.

1 out of 13

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their corollary fringe costs in the foreseeable future.

I have discussed the recognition of attrition as a means of maintaining an adequate rate of return once it is established. This element if properly recognized will only take care of the inflation problem for a short period, say two or three years, depending upon the particular circumstances. The long-term inflation must be met by another approach, that is by recognition of current costs or present value instead of just net investment or original cost. Ever since the U. S. Supreme Court handed down its decision in the Hope case the majority of state regulatory bodies have been following the doctrine laid down in that case of the "end result."

This trend has been arrested in the last couple of years by state supreme court decisions which have forced recognition of current costs, or fair value, in their respective states. I think there are now 16 states which recognize fair value, Alabama being the latest to be added to the list.

Once again the question can be logically asked—what are we going to do about it? The question cannot be answered categorically. Those companies which have been required to raise large sums of new money each year have not been in a position to take a risk of several years' delay in obtaining rate relief while they are appealing a commission decision through the state courts or even the U. S. Supreme Court. Furthermore, some commissions have endeavored to give recognition to the decline in the purchasing power of the dollar by increasing the rate of return so that the "end result" provided adequate earnings on the common stock equity.

However, irrespective of what our immediate situation is, we must face the fact that a proper "end result" can be maintained through a higher rate of return allowance only for a limited time. As decreased purchasing power of the dollar necessitates higher and higher rates of return to attain this "end result," the public will in time rebel against what they would deem excessive rates of return as they would relate the rate of return on pre-inflation investment dollars to the return they are earning on their current dollars. If a commission provides an adequate number of total dollars to meet the financial requirements of a company, which, in effect, is the "end result" theory, and divides those dollars by a "fair value" rate base which recognizes current costs, the resultant rate of return will be lower than if applied to a "net investment" rate base.

Therefore, it appears that the public relations angle of this aspect of maintaining adequate earnings alone will ultimately force the use of fair value or current cost as a rate base.

Left to right: F. S. Florance of Monroe, N. Y.; J. H. Shultz of Richmond, Ind.; W. H. Klingler of Brazil, Ind.; John Harlan of Richmond, and K. C. Miller of Brazil.

In order that we might better visualize the impact inflation has had on plant costs, I have developed a hypothetical situation assuming a telephone company with 1 million dollars of plant at Dec. 31, 1957; further assuming 25 per cent of this plant was installed in 1945 and the balance installed in equal amounts in each year through 1957. To these amounts have been applied an index of telephone plant costs developed by the valuation section of the California State Board of Equalization. This agency has the task of making annual estimates of fair value on utility properties, including telephone, and, therefore, the index can be considered on the low side. Even so, the current cost on this hypothesis is $1,388,000, or 39 per cent, more than the original cost. If a larger portion of capital was installed in 1945 or prior years naturally a greater discrepancy would exist.

In view of all the implications, it appears that if we are going to adequately protect our stockholders and prevent the erosion of their investment through loss of purchasing power, we must in the future once again get present value reinstated as the proper rate base. We must not let expediency dictate our procedures forever. Remember, growth is not attractive to investors unless such growth is translated into increased earnings per share.

The road ahead for regulated industry in maintaining adequate earnings will not be an easy one. Public resistance to higher prices will increase but I am sure we will meet this challenge with the same vigor and enthusiasm with which we have met the problems of the past and we will keep our dynamic industry in a strong competitive position, so that we can meet our public duty, that is rendering the best possible service at the lowest possible price.

Left to right: Sam Phillips of Butler, Pa.; P. M. Schuchart of Tallahassee, Fla.; D. A. Perigo of Everett, Wash., and R. H. Burfeind of Chicago.

ENGINEERING —a Necessary Evil?

*By FRANK D. REESE**

(An Engineering Conference Address)

THIS quizzical subject quite possibly suggests to you that I find myself in a role similar to that of the minister about to exhort his faithful congregation on the virtues of regular church attendance. Perhaps I am; but, even though some of the absentees this morning may need to ponder this question even more seriously than we here, I am sure that our efforts for the next few minutes will not be completely futile.

Most of our companies have come along about the same course of development with respect to the engineering function. The main difference between each company's experience is one of the timing of the phases of this development. In the beginning, there was almost always the "one-man-band" phase where the fledgling company in the then-young industry was run from the vest pocket of one man, or perhaps a very few key men. The enterprise was comparatively small and the technical complexities comparatively few.

And then came growth for most telephone companies — starting years ago for some and perhaps not too long ago for others. With size came increased plant investment somewhat increased specializing of personnel, and a greater urgency for a sound engineering approach to create and guide an advanced-planned program of plant expansion. At this point you might leap to the conclusion that the degree of recognition of the fact that sound engineering procedures are a requirement of good management is merely a linear function of size. But, that there has been another factor, is suspected when we notice that some of the colossi and near-colossi are but on the threshold of such an enlightened state of affairs.

What, then, has been the other compelling factor that has applied an exponential "nudge" to the necessity for the engineering approach? Years ago, when the telephone system was first being developed and constructed, the technical training necessary to permit the interconnection of the various telephone stations was relatively simple. Many of you here can well remember the magneto and manual switchboards of yesterday and the heavy open wire leads that graced many of our city streets as well as our rural highways. In those days, open wire phantom transpositions and a few switchboard relays posted the most difficult technical problems to the telephone man, who, as an individual, usually found it not too difficult to cover most, if not all, of the technical phase of his company's operation.

Fifty years later, the technical complexities are entering our business at an ever-increasing rate. Today, the telephone man is concerned with such things as carrier, microwave, radio, television, dial switching systems, customer toll dialing facilities, automatic toll ticketing equipment, and a host of other types of apparatus and systems which soon promise to include electronic central offices and line concentrators. In fact, the telephone man now cannot afford to be ignorant of these things, because they represent labor-saving and cost-reducing techniques without which his business cannot long survive.

And where does the operating telephone company engineer fit into this picture? In this day of unavoidable specialization, he is the applier, using such new components and systems as these to create the telephone communication systems which will provide the service his company is called upon to render. At the same time, like all engineers, he has a creative responsibility, too. His is the perception to recognize the need for specific improvements and advances and new instrumentalities for the communication network. His counterpart in the laboratory and factory must then bring science to bear on these recognized needs to develop new components for the system and devise tools and methods for producing these components in quantity. The telephone company engineer then closes this never-ending cycle by applying the newly-created instrumentality.

As you might expect, and some of you know first hand, the telephone engineer's job is a never-ending one. He is responsible for determining how much and what kind of material and equipment should be purchased, and when and where it should be placed. His creation is never quite complete. It is constantly being enlarged, improved upon and replaced. His new components are often different from those in service, yet he must fit them all into a smooth-working, well-integrated system.

And, his is a big job. This year the gross addition of the General Telephone System construction program will be 190 million dollars. The program of the entire Independent industry is probably in the neighborhood of 500 million dollars, and of the industry as a whole, over 2.7 billion dollars. Depending on your company's size, your program is a proportionate share of this over-all figure. There are some 15

The report of the USITA Engineering Committee Chairman P. H. Henson will be published in a later issue.

*Mr. Reese is Engineering Director of General Telephone Service Corp. of New York City.

or 16 thousand engineers and assistant engineers who are concerned with this construction program full time in our industry's operating companies. There are many more people, especially in the smaller companies, who have these responsibilities as a part-time duty, which make them nonetheless important to the smaller operations. On the maintenance side, there are some 25 billion dollars of plant in the industry which must be constantly supervised and nurtured to the most effective use at the lowest upkeep.

The telephone engineer has a responsible job. Fixed assets in the telephone industry probably account for more than 90 per cent of our total investment as compared to a much lower figure for most other industries, where a large percentage of the investment is in inventory and other liquid assets. About 80 per cent of the capital funds of operating telephone companies are invested in so-called "engineered" plant. The "catalog" does not tell the engineer what to buy, when to buy, how much to buy, or where to place the apparatus. He cannot pass along his responsibility for his decision to top management. Many elements of his problems are such that top management can give him only general guidance in the form of the rate at which money can be spent, relative priorities of service, etc.

And, the stakes are high for the telephone engineer. The wisdom with which the plant investment is made to create communications networks determines, in large measure, the fortunes of the company. Money once spent for telephone plant can seldom be recovered, and the mistakes in placing physical plant cannot be corrected for a long time. For example, a 5 per cent variation in cost between good and indifferently engineered plant is not unreasonable, and is much smaller than you would expect from bids by competent independent engineering firms, if they existed, and if they were used. At the current rate of construction in the Independent industry alone, and on the portion of the construction expenditures made as a direct result of an operating company's engineering effort, this difference would amount to about 20 million dollars per year in capital expenditures — an amount which approaches the salaries of all the operating company engineers involved. And, that is not all. The annual charges on this 20 million which go on for the life of the plant, would be about 5 million each year. If the engineers make wrong decisions, the customers will have to pay higher rates or experience poor service or both for years to come as a result. Also, the ability of the company to earn adequately will obviously be jeopardized.

Left to right: B. R. Fox of Tyler, Tex.; Warren Weber of Remsen, Ia.; Mrs. Weber, and Mrs. F. W. Daubendiek of Remsen.

As you might expect, like the man sorting apples, the telephone engineer is constantly facing decisions. What factors does the engineer weigh in order to reach his decisions?

First, *quality of service versus cost of service.* Many engineering decisions offer the opportunity of improving service or cutting costs. A good engineer is always striving to do both. Sometimes the engineer must decide how much of each is appropriate. To illustrate: If a new telephone or improved sensitivity is developed, shall the improvement in service be given to the customer in the form of better volume, or shall it be given to him in the form of lower cost by using cable of smaller wires? Or, should it be used to extend the same quality of service a greater distance?

Second, *capital versus expense.* Almost every job involves some choice between a relatively higher first cost with lower operating or maintenance costs, and the lower first cost with higher maintenance cost. This choice also involves a continuity of service in conjunction with maintenance costs inasmuch as high maintenance is sometimes coupled with poor service continuity. Here, again, the good engineer strives to reduce both capital costs and expense.

W. A. Rockwood (left) of Rochester, N. Y., and N. H. Case of Hudson, O.

Third, *standardization versus progress.* This is a real fence-walking situation. Standardization is one of the keynotes to success of the communications networks, inasmuch as it permits facilities to work together with uniform operating procedures throughout the country, and material and equipment costs to be reduced where the elimination of needless varieties allows production and supply effort to be efficiently concentrated. On the other hand, standardization and progress are incompatible. The telephone engineer must constantly determine when and how far to deviate from standardization in order to enhance progress.

Fourth, *today versus tomorrow.* This is just another way of saying, how well can the engineer guess the future? This involves not only what the public wants in the way of service and where they will be living, but what the technology will be within the lifetime of the plant under consideration.

As you may suspect from the discussion thus far, the telephone engineer not only must have a knowledge of technical things, but he must guide his management by planning the step-by-step investment in plant so that it will render the maximum amount of revenue-producing service at a minimum of expense, and in such a manner that future changes, additions, and advancements in the art may be incorporated without major impairment of previous investment.

Obviously then, the engineer must develop definite plans, including long-term forecasting, and continuously supervise and effectively coordinate studies and the actual construction program. This important part of the engineer's work is sometimes slighted if not outrightly

(Please turn to page 128)

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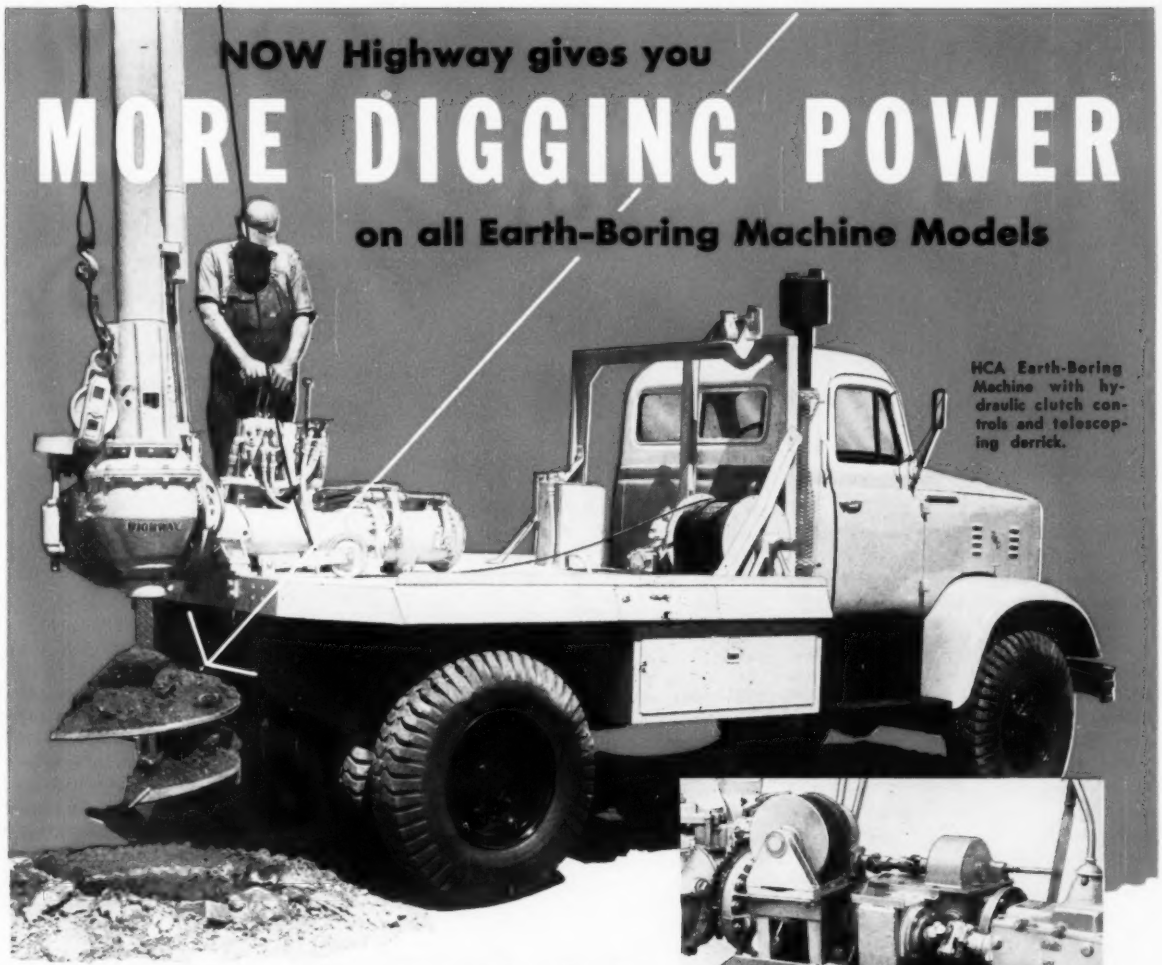

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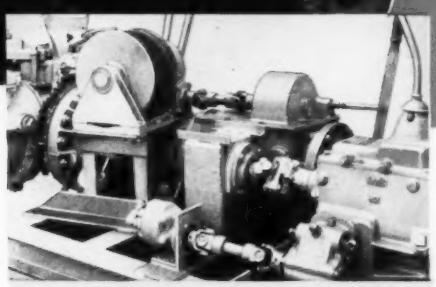

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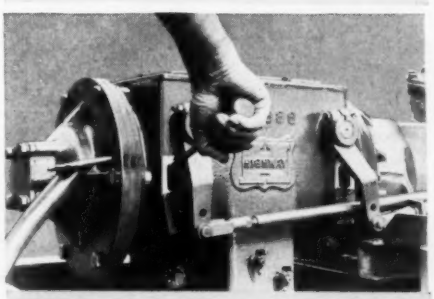

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The Voice in the Distance

By D. J. TOMPERS*

(An Engineering Conference Address)

CERTAINLY, you will agree that living in this atomic age of ours has further accelerated the American way of life. Not that this has been necessary, for we have always moved at a pace which has left most nations breathless. You might say that our motto has been "Bigger, Better and Faster." And to amplify this I would like to relate the expressions of a young Spanish exchange student who on visiting this country and looking about him, exclaimed, "Very different; very strange. Over there they say 'this is 400 years old'. Over here they say, 'this is 40 stories high'." So, we rush on, improvements upon improvements—a never ending cycle.

This is particularly true of the communication industry. Let us stop and consider the short period of time that has actually passed since the memorable achievement of Bell's where he succeeded in passing voice over wires between rooms within a single building (1875) — to the point where voice transmission was perfected between subscribers within the same town (Boston) — to the point where messages were transmitted over a pair of wires between Boston and Cambridgeport (2 miles)—to the *unthinkable* achievement of construction of a transcontinental telephone line (1915) and all this within a period of 40 years—then the advent of open wire carrier, the coaxial cable, microwave radio. What next?

Of course, in all of these achievements, that is, dating from about the time of a transcontinental telephone line, there has been one character who has had a vital part in the performance, and that is the transmission engineer—God Bless him! His has been the problem to provide adequate (that word could stand some definition and explanation) transmission from point "A" to point "B".

We might exaggerate just a tiny bit in the statements to follow, but they are not too far afield I'm sure. Thirty to 35 years ago a resident in New York would have hesitated to call Centerville, Kan., with the exception of dire emergency, and if the call had been made, both parties would have shouted louder and louder, until their speech was practically unintelligible, and then probably only part of the information would have been successfully transmitted. Let us say that 20 years ago the same call successfully completed, with minor difficulty in hearing, would have assured the telephone company of a glowing tribute to its success. However, in the age we're living in today, the least distraction or evidence of poor quality, regardless of distance, is certain to bring criticism from our subscribers. To him, today, the "voice in the distance" must be the same as that of the person at his elbow, and he does not look upon transcontinental conversation as being any different than calling his wife at home within the same town.

From the beginning of the telephone industry, through the year 1914, long distance transmission of speech was limited by attenuating effects of the telephone lines themselves. More simply stated, the reduction of voice currents is due to electrical loss, resulting from circuit capacitance, inductance, resistance, etc.

In approximately 1915 the telephone repeater, employing vacuum tubes, was introduced. This represented a tremendous strike forward in the science of communications, and with it ushered in the era of transmission engineering. Telephone companies began to broaden their outlook. They began to concentrate on quality of service on a long haul basis. The last 40 years, and particularly the last 15 years, have seen continued service improvement.

If we were gifted as some of God's creatures, to be able to adjust ourselves to situations and circumstances that prevail, we would be able to tune our ear to listen to a telephone conversation and block from it all the other extraneous noises. This, however, is not our ability, but rather the reverse seems to be true. The minute we pick up a telephone to a conversation, our ears seem atune to the extraneous noises that descend upon us and what we would normally disallow immediately rises to gigantic proportions. This situation in itself must always be remembered.

The result, once again the "voice in the distance" must represent the person at your elbow. There can be little echo, little side tone, no straining of the eardrum to hear the whispers at the distant end, rather the conversation must be carried on as easily as I am here talking to you. Herein rises the problems of the transmission engineer.

As long distance has become more popular, the demand for improved service has been his responsibility. The transmission engineer has developed electronic devices in an ever increasing variety of design. The cost of engineering and providing this equipment could be reconciled somewhat by the knowledge that improved service would increase long distance calling and bring in more revenue. Short-haul calling, always a concern of the transmission engineer, did not lend itself to the expenditure of vast sums of money for complex electronic devices. . . Both long and short-haul transmissions have improved throughout the years, but . . . our biggest strides have been made in the field of long-haul transmission problems. This, of course, is due to the

*Mr. Tompers is Chief Engineer of West Coast Telephone Co., Everett, Wash.

practical aspects of transmission engineering. Vast sums of money on short-haul calls, for the purpose of eliminating the wide disparity in transmission losses between several local circuits, has not been economically practical. On the other hand, in most instances, long-haul calls have paid their own way.

The advent of nationwide toll dialing added to the problems of the transmission engineer. The old problems of volume, distortion, side tone, line noise, uncontrollable user problems, attenuation, etc., were joined by problems of another kind; alternate routing, echo tolerance, via conditions, via net loss, via net loss factors, and switching pads became the new phrases of the transmission engineer—each one representing problems, or the solution to problems.

Nationwide toll dialing plan is a communicative network throughout the United States and Canada enabling any customer to call any other merely dialing his number. . . . Generally, the plan is based on the principle called "automatic alternate routing." Any calls between two points may have many paths, varying in complexity from a direct connection to a connection utilizing as many as seven intertoll lengths in tandem (between Class 4 Office "Toll Center" or "Toll Point"), plus the originating and terminating lengths, for a maximum of nine lengths.

The characteristics of various intertoll circuits used on successive calls between two telephones can vary greatly due to alternate routing. In order to avoid a large transmission variation on successive calls, and to eliminate the possibility of inadequate transmission, it is imperative that the loss of each length used in connection be kept at a minimum. Ideally, of course, operating all circuits at zero db level would make the transmission independent of the number of circuits used in any one connection. Obviously this would be a large order. Actually the great distances involved, prohibit a zero db circuit due to the necessity of operating even the best facilities at some loss. To insure that suitable characteristics pertaining to transmission are maintained, minimum losses must be maintained, but to establish a procedure to maintain a minimum loss for each length and for each makeup or circuit route, would be a task of unbelievable difficulty.

Left to right: Antonio de la Luz, I. W. Gleason, Antonio G. Artiles, and Hector Rangel, all of Havana, Cuba.

A compromise plan has been adopted which established minimum practicable loss in a toll circuit. This minimum loss is known as "via net loss." What is via net loss? To attempt to state it as simply as possible and in broad terms, via net loss is the minimum loss measured in db at which a circuit can be operated when switched at both ends to other circuits without the objectionable noise, cross talk, singing or echo. It assumes that the circuit to which it switches will have 2 db or more loss between the switch and a local telephone office.

As I mentioned earlier, our ear seems to automatically tune itself to such things as crosstalk, singing and echo, which rise as a definite distraction, so these must, therefore, be removed or suppressed to the point where they are tolerable. Of the four, echo is usually controlling in the design of intermediate switching links. Designing a circuit to hold echo within the range of customer tolerance in loudness and delay will, in a majority of cases, meet the requirements for singing, noise and crosstalk if standard transmission designs are followed.

Echo is just what the name implies. Acoustical echo is the effects of sound bouncing back from physical obstacles. Many of you undoubtedly have heard it by calling into a canyon, or against a mountain range, or into a lake surrounded by trees on an early morning. Electrical echo results from currents bouncing back from electrical obstacles in a telephone path. The obstacle is a mismatch in impedance encountered by the signal. In telephone conversation, echo delay is an important distraction factor. The longer the delay, the more the distraction. Considerably louder echoes will be tolerated if the delay is short. While both the talker and listener may hear echoes, the talker echo is usually controlling in the telephone circuit design.

There are usually three factors involved in determining the loudness and delay of talker echo: (1) circuit loss talker to electrical obstacles including the far end; (2) circuit loss from these obstacles back to the talker; (3) return loss at the electrical obstacle.

Return loss is the loss in db between the power of the reflected signal, due to mismatch, and the main signal. When the mismatch occurs, the main signal is said to arrive in impedance discontinuity. Obviously, if the two impedances at any one point are perfectly matched the return loss is infinite. In this case, no energy or superfluous signals are received. The old technique of added loss to overcome echo does not meet requirements of the

Left to right: Vernon A. Allan of Scottsbluff, Neb.; Don Childers of Kansas City, Mo., and Aubrey E. Sikes of Glennville, Ga.

switching plan of today. The switching plan of today makes the "voice in the distance" as constant in quality as the voice across the conference table.

What about via net loss? What are its applications? How do we determine it? The via net loss of a circuit may be obtained by multiplying the circuit length by a value called the "via net loss factor" and adding .4 db for variations of the individual sections of the circuit, if we follow recommended design procedures which meet crosstalk, singing and return loss limits. This gives the via net loss at which each circuit can be operated. This holds true regardless of the number of lengths in action. Via net loss factors are computed from a statistical analysis of customer tolerance to echo and the transmission characteristics of the circuit. As I have said, loudness and delay play an important factor in the customer tolerance to echo. Therefore, decreasing the objectionable effect of echo, decreases the via net loss factor.

Via net loss and via net loss factor are available for either two-wire or four-wire circuits. However, four-wire circuits have no intermediate return loss paths and may, therefore, be worked at lower losses. It is desirable at this point to discuss the difference between four-wire and two-wire circuits. . . . Basically, a four-wire circuit utilizes one pair of wires to talk and one pair of wires to listen. Obviously, a two-wire circuit uses the same pair to talk and listen. Four-wire circuits minimize echo return, and for that reason are recommended in via net loss operation of intermediate switching links.

Does this mean every trunk needs two pair? No, but two-wire circuits, except for circuits to end offices, must use approved four-wire termination sets when hooking into four-wire or carrier-derived circuits. . . .

Four-wire termination sets are used to convert one-way, four-wire circuits, or circuits employing send-receive paths, or two-frequency, two-wire circuits back into two-way, two-wire circuits. Basically, they consist of a balancing transformer and a balancing network. By a balancing transformer, we mean a hybrid coil. The balancing network is sometimes a part of a hybrid coil and sometimes a separate unit from the four-wire set. Hybrid coils provide a means of converting four-wire to two-wire with a minimum of reflection between the transmitting and receiving. No simple solution is available at this time for two-wire circuits not equipped with terminating sets, although an office balance factor has been devised for the purpose of intertoll trunk design. We will discuss this office balance factor later on.

Left to right: G. W. Wall of Vienna, Va.; Joseph Cheeseman of Washington, D. C.; K. W. Vogt of St. Paul, Minn.; H. C. Starkweather of Arnold, Md., and Phil Stewart of Seattle, Wash.

In order to establish minimum practical loss of the shortest possible circuit, it must be remembered that an intertoll trunk may be operated in one or two conditions: (1) When the trunk is terminated in a telephone set at one or both ends through local plant, it is said to be in a terminal condition; (2) when the trunk is in an intermediate link in a switch connection and both ends are extended by other trunks, it is said to be in the via condition.

For practical reasons the trunk must be used for both terminal and via service. By introducing a loss at the end of an intertoll circuit, in its terminal condition, it is possible to utilize this circuit for dual operation. Such a loss is achieved by adding pads to build out the loss in trunks to local offices to 2 db. The minimum practicable loss for the shortest possible circuit operated at via net loss will have a loss of at least 4.4 db. This is 2 db for each terminating loss plus .4 db variation favor. This is assuming, of course, that our echo delay factor is zero.

In considering the longest circuit to be operated at via net loss, the statistical and technical side of via net loss rears its ugly head. In a brief discussion of this kind reliance on statistics and technical terminology is not only boring it is in most cases probably foolhardy. To those of you in the process of going via net loss or contemplating joining the nationwide network in the years to come, I would suggest consideration be given to the many fine texts available from manufacturers and the Bell System on various equipment required.

For the purpose of this talk, however, it is necessary to discuss briefly the problem of office balance. The two-wire office is said to be equivalent to a four-wire switching office if the average return loss for all intertoll trunks is equal to 27 db or better. Two methods of obtaining this equivalency is by drop and network building out so that the compromise network will match the impedance of all paths through the switching office. If this balance is not achieved, a "b" factor is assigned the switching office to provide the same echo performance as the four-wire switching office. . . . This "b" factor is applied to intermediate switching offices only and not to ordinary toll centers (Class 4 offices).

Naturally, it is desirable to avoid the need of assigning a "b" factor since this would only add loss to each switch connection. If this occurred at a number of offices on any one connection, the

(Please turn to page 152)

Left to right: Nap Videan of Bellevue, O.; C. E. Carlson of Lake Crystal, Minn., and Clarence Arnold of Mankato, Minn.

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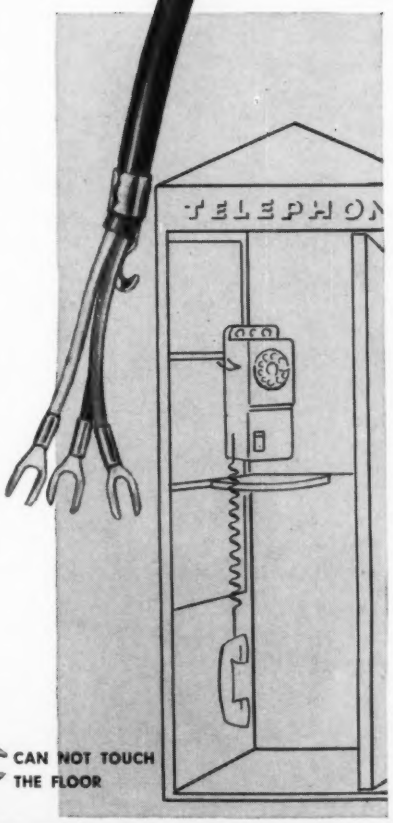

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Reducing Federal Highway Plant Relocation Costs

By ALLAN R. STACEY*

(An Engineering Conference Address)

THERE ARE over 600,000 miles of telephone pole line located in this country, excluding Alaska. The company I operate, Sunland-Tujunga Telephone Co., has 128.9 of these pole miles located in the community of Sunland, Cal. Stretched across the United States are more than 4,000 telephone companies, many like Sunland. These telephone companies serve two-thirds of the geographical area of the United States and are beginning to feel the impact of the monstrous program authorized by the Federal-Aid Highway Acts of 1956 and 1958.

The Highway Program

Federal-Aid Highways total 776,072 miles of federal aid interstate highways primary routes and secondary routes. During 1957, 7,386 federal-aid projects were advanced to actual construction at a total cost of 2.4 billion dollars.

The national system of interstate and defense highways to be built over the next 13 years will connect as directly as possible the principal metropolitan areas, cities and industrial centers serving the national defense. It will link together 90 per cent of the cities having populations in excess of 50,000 and will connect 42 out of 48 state capitols as well as over half of the rural population of the United States.

In the legislative history of the Federal-Aid Highway Act of 1956, Congress said of this enactment, "In its entirety, it will be one of the greatest construction projects of all times."

Burden on Telephone Companies

Of the federal-aid highway projects envisioned under the 1956 Act as amended, it has been reliably estimated that 25 per cent of the total proposed mileage will require the removal, relocation and reconstruction in new locations of the service facilities of utilities. You and I, Mr. Telephone Company Operator, have 611,450 miles of telephone pole lines and many of them are going to be moved by this highway program.

This program represents an enormous economic burden laid at the door-step of utilities. It is all the more burdensome when you consider (1) it means in most instances the building of duplicate facilities so that the customer may have continuous utility service, (2) it assumes the immediate ability to engineer the new project, (3) it assumes immediate availability of standard materials irrespective of manufacturing delays, (4) it assumes no difficulty in negotiating and securing the necessary rights of way, (5) it assumes the necessary construction forces being available, and, above all else, (6) it assumes the immediate ability to raise the necessary capital, for nobody is going to voluntarily advance these funds to us.

We as utilities are being accused of throwing a roadblock in the path of the Federal Highway Program. Clifton W. Enfield, general counsel for the U. S. Bureau of Public Roads, stated in 1957:

"The bureau's study indicated that in approximately one-third of the states, highway construction progress is often seriously impeded by delay in utility adjustments. It was found that delay in highway construction, because of utility relocation, resulted principally from (1) lack of adequate advance planning and investigation, (2) lack of adequate liaison between the highway agencies and the utility companies, (3) lack of an early firm commitment by highway agencies in scheduling projects for advancement to construction and (4) lack of adequate funds, personnel and equipment on the part of utility companies."

Solving the Problems

Here is how some of the problems are being solved:

Example No. 1. There was an underground system carrying six large telephone cables located in a five-corner intersection which was involved in highway improvement. The telephone company had no advance knowledge of the project, but learned of it about the time it was advertised for bids. Upon making a hurried investigation it was determined that there were seven drainage conflicts. Fortunately, by change in plans of the state, which incidentally cost the state no more money, the drainage conflicts were resolved and the advertising of bids was held up while the plans were revised. As a result, not only did the telephone company save a substantial sum of money but tying up of automobile traffic at that intersection for three months was avoided.

Example No. 2. By shifting the arc of the proposed curve in a highway, a matter of seven degrees, a utility was permitted to stay in its original location.

Example No. 3. There was an underground conduit system located in the unused portion of the highway right-of-way. It was proposed to widen the highway by taking an additional width on both sides. To avoid relocating this conduit system at great expense, the state found it possible to take the entire additional width on one side of the highway.

The Utility Must Know

In order to solve problems in the above manner the utility must know what is proposed to happen and it must know long before the bids are advertised, but here is the picture which unfortunately prevails. The key agency in many public works groups on state, county and local levels designs and engineers highways and other improvements to provide what it wishes to accomplish. After its plan is com-

*Mr. Stacey is Vice President of Sunland-Tujunga Telephone Co. of Sunland, Cal.

pleted and the contract is about to be let for construction the agency then, and then only, for the first time brings in the utility to tell them about the project.

What is the answer to this vexing problem? It can be described in one word—"information." You and I, and the state, and the public can all save if the utility gets "information" soon enough.

Experience in states where difficulties have been largely overcome indicates that understanding of the problems involved and initiation of action to solve them must begin months, or even years, before a project is advanced to the construction stage. The most important and effective step consistently taken in those states that have successfully solved the problem is to arrange for conferences between representatives of highway agencies and the utility companies as soon as the location and the plans for a highway project have been developed sufficiently to indicate approximately what utility adjustments will be required. As a result of such conferences, the utility is able to make detailed studies of the extent and cost of the work to be done and is able to do all the necessary budgeting and acquiring rights of way and scheduling the crews to perform the work.

Benefits of Liaison

Now, let's expand our word "information" so that it requires action as well as listening. Let us translate it into "liaison" which means the most effective cooperation between the highway official and the utility official by keeping each other informed to the maximum degree as to highway planning development and in working together as the utility company makes the necessary adjustments to its facilities. The benefits will be indeed attractive and worthy of effort.

LIAISON BENEFITS TO HIGHWAY ADMINISTRATOR.

(1) Completion of highway projects with no delays occurring because of utility facilities interfering with road construction.

(2) Lower bid prices for construction by contractors.

(3) Elimination of claims against the state on the part of the contractor for delays and added costs.

LIAISON BENEFITS TO THE UTILITY.

(1) It is easier to get changes made in preliminary plans than in the final plan after it has been approved by a state bureau.

(2) Continuous service to the utility customer is more easily maintained.

(3) Since relocation costs to a small utility can at times be financially disastrous, liaison is of extreme importance to permit advance arrangement of financing.

(4) It becomes possible for the utility to plan the work so as to acquire the necessary materials in an orderly manner and to schedule adjustment or removal of facilities at a time convenient and efficient for work crews with a minimum cost for the entire operation.

Plan for Liaison

Prior to attending today's meeting I made personal contact with more than a dozen of telephone companies operating in my home state and asked whether they were encountering difficulty in liaison regarding the highway program. Each company contacted, ranging in size from almost 1,000,000 telephones down to 500 telephones, reported that it was obtaining adequate information well in advance of required relocations. Therefore, I feel it would be helpful if I described briefly how this liaison is conducted in one state:

(1) This state develops a five-year planning program for highways.

(2) In advance of final selection of the route for a highway change a public meeting is held and the state bureau notifies each of the utilities involved.

(3) A selected route is submitted to city councils and county supervisory bodies for their comments and approval. Following this the route is submitted to the highway commission for adoption. These actions occur three to four years before construction.

(4) The state bureau gives the utility a sketch showing the state's ideas of the necessary changes or routing.

(5) The utility makes its own suggestions.

(6) Finally, a written agreement is consumated containing the changes and allocating the costs.

Frequently, the state supplies the utility with a rough print of the proposed route upon which the utility enters its facilities and returns the print to the state.

Frequently, the state makes preliminary examinations to determine how expensive the plant is that is to be relocated and sometimes changes routes to avoid expensive relocations.

In my opinion, people are really more important in cooperative liaison than the type of organization and procedure that may be officially established. Nearly any arrangement works well when cooperative and objective people with sincerity of purpose are involved. Nothing works when the reverse is the case. Uniformity of practice in every state is impossible. But, uniformity of desire

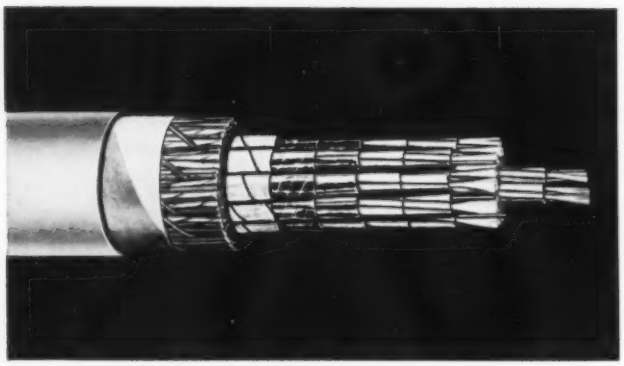
(Please turn to page 129)

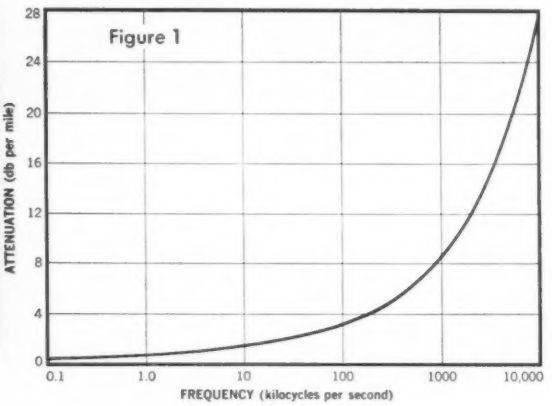
Left to right: K. C. Gillette of Chicago; W. H. Klingler of Brazil, Ind.; Henry E. Jensen of Conshohocken, Pa., and Frank Thiltges of Chicago.

Left to right: Don Carlson of Morenci, Mich.; Mrs. Carlson, and Vincent Danielson of Andover, Ill.

GENERAL CABLE MANUFACTURES

VIDEO PAIR CABLE





VIDEO PAIRS are wide range, balanced transmission lines which are finding ever-increasing uses for high frequency applications. These specially designed pairs can be incorporated in cables containing either paper insulated or plastic insulated telephone pairs or incorporated within their own lead sheath or plastic jacket. Video pairs are in general use for remote TV pick-up points such as athletic fields and convention halls. These same pairs are also suited for a variety of other high frequency applications such as closed circuit TV, telephone carrier circuits and links to microwave stations. Cables containing video pairs are suitable for aerial or duct installation or can be armored for direct burial and submarine use.

The basic video pair consists of 2 conductors of #16 AWG solid annealed uncoated copper, insulated with foam polyethylene. These are paired with fiberglas-reinforced foam polyethylene fillers. Over this is applied a helically wrapped polyethylene tape, a parallel fold copper tape, and a helically applied copper tape. Video pairs that are used under lead sheaths will have creped kraft paper tapes applied over the copper shielding tapes and those under plastic jackets will have a polyethylene tape applied over the copper shielding tapes. When several video pairs are incorporated in a cable, the length of pairing lay will be varied and the pairs will be arranged in the cable to minimize magnetic coupling between pairs.

CONDUCTOR RESISTANCE: The conductor resistance shall not exceed 23 ohms per mile of cable (68°F).

MUTUAL CAPACITANCE: The mutual capacitance shall be not more than .058 microfarads nor less than .051 microfarads per mile.

CAPACITANCE UNBALANCE: The capacitance unbalance between conductors and shield shall not exceed 0.50 micromicrofarads per foot.

DIELECTRIC STRENGTH: Insulation shall be capable of withstanding a-c test potential for 2 seconds (maximum instantaneous) of 2800 Volts between conductors and between conductors and shield.

INTERNAL ECHO: The worst internal echo in a video pair shall be down at least 36 db from the measuring pulse.

CHARACTERISTIC IMPEDANCE: The characteristic impedance shall be 125.5 $\pm$ 3.5 ohms.

ATTENUATION: Figure 1 shows attenuation versus frequency on a typical cable.

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Broader Service Horizons —Data Transmission

By V. N. VAUGHAN JR.*

(An Engineering Conference Address)

ONE OF the most interesting and exciting things which we can do is to speculate on the future of communications. Let us take a broad, long-range look at the telephone industry and its future growth. Certainly we in the U. S. can be very proud that we have achieved the highest development of the telephone business of any country in the world. With about 80 per cent of our U. S. homes and practically all of our business and industrial locations now equipped with telephones, we can be justly proud, but not complacent. Where do we go from here?

Historically, any big industry seems to go in either of two directions, up or down. Consider, for example, the wagon and buggy industry. It grew up a pinnacle of success and then deteriorated. However, at least one company considered itself to be a manufacturer of "vehicles for personal transportation" rather than just a wagon builder. Although there may be some debate as to whether this company made the decision early enough, it nevertheless did make a successful transition to the production of automobiles. Historically, an industry seems always either to continue to grow, or else to diminish, in its importance in the over-all economy. It appears virtually impossible for a big industry to "level off" and stay that way.

Certainly there is no inclination on the part of anyone in our business to want to "level off." Such an attitude has never been the part of the telephone tradition of service. We have been so busily occupied that we probably could not level off even if we wanted to. The industry has been developing and applying new carrier systems, new microwave transmission systems and is now hard at work on electronic switching. With such systems, which permit us to do our job better than we have in the past, we are essentially lifting ourselves by our own "electronic bootstraps."

Nevertheless, the pattern of the times in which we live does affect the manner of our growth. Our future growth is much more likely to be horizontal than vertical, that is, a greater growth in usage rather than continued growth in the number of telephones. Although there are more homes with two cars in the garage than there are with two telephone lines; and, although there are still a number of farms yet to be served, the simple fact of 80 per cent development of the home market (and a higher development of the business market) suggests that our growth pattern will inevitably be in usage.

Of course, considerable increase in usage will result from social and economic forces—people traveling about the country so much more than ever before, and relatives living in more widely separated locations. In addition, the need for data transmission is a specific aspect of this growth in usage which promises to become a major factor in our business.

There have been many predictions by well-informed people, such as at a recent Joint Computer Conference, that within the next 20 years the usage of telephone circuits for data transmission will equal their usage for ordinary voice communications. While some telephone people feel that this estimate is a little exaggerated, the consensus of informed opinion is that there will be a tremendous upsurge in the use of telephone circuits for machine-to-machine "talk."

Automation

The manufacturing industry has developed the automation of materials handling to a very high degree. Similarly the business machine industry is now developing the automation of clerical operations—the handling and processing of information. Experts agree that business and industry are just beginning to clearly understand, and to substantially use mechanized-electronic data processing. IDP (Integrated Data Processing) will accomplish for "paper" work the same streamlining that has resulted from the production line for materials handling.

Some of the same information that now flows over our circuits on a person-to-person (voice) basis will, in the future, be transmitted as "data" from machine-to-machine. Further, as IDP develops, much of the data which now travels by U. S. mail will flow over telephone circuits.

This is our job to provide the "I" in "IDP"—to integrate, to tie together the various locations, somewhat like the way our nerves connect our muscles to our brain.

When we listen to our customers, we hear many urgent requests for data communications. It is no longer a question of whether telephone circuits can be, or will be used for data transmission, but only a question of how best to provide for the use of these circuits for data transmission. All of you share in the responsibility to meet this service need. Fortunately, the telephone industry has a considerable wealth of experience in providing facilities for telemetering, teletypewriter, facsimile, television, etc. We have both the basic facilities and a vast resource of know-how and capability upon which to draw.

Type of Facilities

In seeking methods of meeting this new responsibility, it is appropriate that we review existing service offer-

*Mr. Vaughan is with the American Telephone & Telegraph Co.

ings and the kinds of facilities which are available. Examining this chart *(Chart 1)*, and reflecting upon the costs or charges for the grades of facilities shown, we conclude, in general, that the bigger the pipe (i.e., the greater the bandwidth of the channel), the lower will the cost be for transmitting a given volume of data. The customer can send more "bits per buck" over the wider bandwidth channels.

The term "bit" is a contraction of the words binary digit. It might be called the smallest possible piece of information, either a "yes" or "no."

While most of current data systems are binary digital data systems, it is by no means sure that the next generation of progress will not return us again to a point where analogue systems will be in the ascendency. Today, however, the digital systems are generally more attractive.

Even for the transmission of speech, telephone research people are looking very favorably at digital (pulse modulation) systems. We may find our telephone plant of the future increasingly using pulse techniques for both transmission and switching. "Time division" shows promise of replacing "frequency division" (carrier) and "space division" (switches).

The conclusion we draw from *Chart 1* is most natural, for things nearly always come cheaper in big volumes. There are, of course, always exceptions to this general rule. For data transmission, it is not economic to spend large amounts of money on high speed terminal equipment to transmit small amounts of information over any distance, or to transmit large volumes over short distances. There must be an economic balance between terminal costs and line costs—depending upon the volume of traffic and the distances involved. It is uneconomic to use a 10-ton truck just to carry a one-pound package—likewise, it is uneconomic to use wideband facilities (such as video) to handle proportionately small volumes of data.

DIGITAL DATA TRANSMISSION

	Bandwidth (Cycles)	*Bits Per Second*
Teletypewriter (60 words per minute)	170	45
Telephone Circuit	3,000	600-1,000-?
Radio Program Circuit	15,000	8,000
Video Circuit	4,000,000	1,000,000

Above figures are order-of-magnitude indications for channels. Terminal equipment is not included.

Chart 1

All of our studies of data transmission needs indicate that the basic voice band is the most suitable bandwidth. It can handle the required volumes most economically. Further it permits the widest variety of terminal designs to balance, for a variety of needs, the economics of terminal-vs.-line costs.

Other important factors favoring the selection of voice band facilities for data transmission are their widespread availability and their flexibility. There are telephone lines under most of our streets, entering most of those places where data communications will be needed. All indications are that data communication needs of the future will be as diverse in geographic traffic pattern as present telephone service.

Just as people at scattered locations need to talk to each other, likewise data will need to be collected from and sent to scattered locations. Consider, for example, meter readers, or the grocery store ordering-inventory problem, or the banks, or the department store charging and credit checking needs, or the hauling-trucking industry. With some truckers, there is need for small amounts of data to be originated at as many locations as trucks may pick up or deliver—largely a local data transmission need. Likewise the truckers have a considerable long distance data transmission need. A typical trucking company may have 150 major terminals at locations scattered around the country.

Many situations like the foregoing lead us to the inevitable conclusion that the best way of handling data communications is over the regular local and long distance telephone facilities.

Business Machines

To better understand the engineering problems of transmitting data over regular telephone plant, it is first necessary to understand something about the machines which must "talk" over these facilities. Essentially, there are (1) data input devices, (2) data processing equipments, and (3) data output devices — often printers. As *Chart 2* indicates, there are a wide variety of data input devices—manufactured by a number of business machine and office equipment companies.

DATA ORIGINATING DEVICES

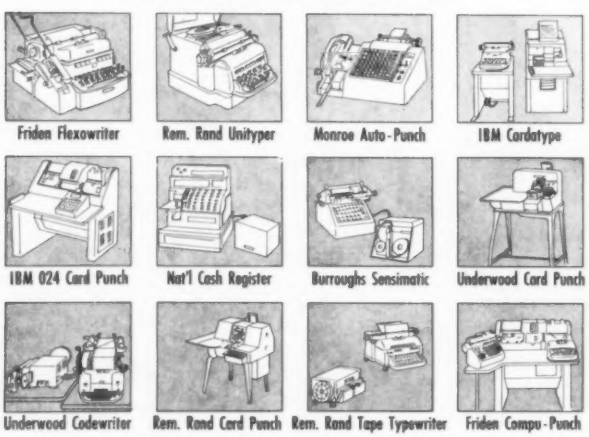

Chart 2

DATA SYSTEMS
SOME FORMS OF RECORD MEDIA

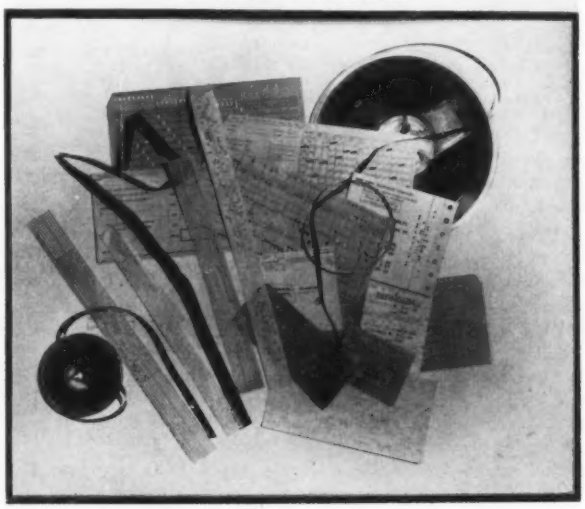

Chart 3

WARREN

first in

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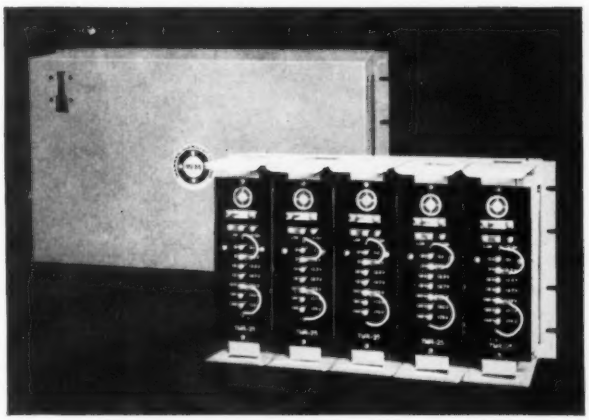
products for the telephone industry

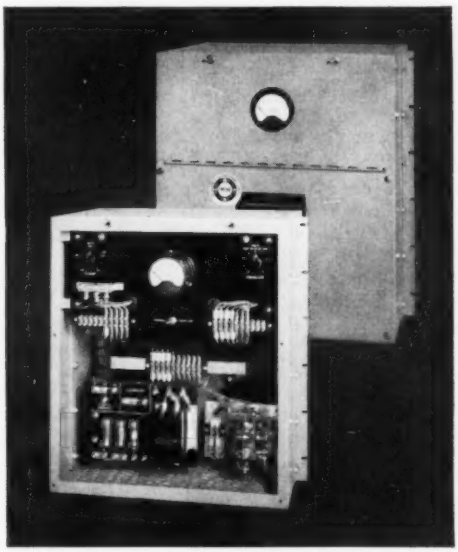
Now, the benefits of transistor circuitry are used by Warren to bring a new concept in power equipment dependability to the Independent Telephone Industry. Warren's new all-transistor ringing generators and new transistor battery chargers provide a degree of operating efficiency heretofore unknown...efficiency that will mean significant power savings in every exchange operation. Whether your plans call for expansion or needed replacements, investigate the many benefits of the new Warren transistor multi-ringer and transistor battery charger.



TRANSISTOR MULTI-RINGER...

for warranted dependability

Powered direct from 48 volt office battery, the Warren all-transistor type TMR ringing generator is designed to give you years of maintenance-free, adjustment-free, uninterrupted operation. Long-life transistors give extremely high 75% full-load generator efficiency... permit the TMR to quickly pay for itself in power savings alone! Voltage regulation is improved to insure customer satisfaction with constant ringing intensity. Synchromonic, Harmonic and Decimonic ringing frequencies are accurate to within 1/6 of a cycle and never require field adjustment. 100% transistor circuitry permits absolutely cool and quiet operation in a neat-appearing, self-contained package only 10½ inches high by 19 inches wide. This new 4000 line capacity Warren transistor multi-ringer... with dependability warranted...is available from stock.



TRANSISTOR FLOAT RECTIFIER...

for better battery management

Operating efficiently from utility power, the Warren type TFR transistor battery charger is designed to add years to battery life. A complete line of TFR's are now available in standard sizes from 3 to 400 amperes. Tubeless, completely static, they provide steady, humless direct current for float-charging of every type of 48 volt office battery. Floating or equalizing voltages are precisely regulated within ½ of one percent for changes in supply voltage and load. Germanium transistors, improved magnetic amplifiers, and silicon rectifiers assure dependability by eliminating troublesome vacuum tubes and selenium rectifiers. Efficiency is increased, regulation improved, while the size and weight are reduced. This gives you a reliable program of better battery management.

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WARREN MANUFACTURING WM

THE **WARREN** MFG. COMPANY, INC.

LITTLETON, MASSACHUSETTS

FIRST IN TRANSISTOR PRODUCTS FOR THE TELEPHONE INDUSTRY

Each of these keyboard devices is capable of recording data in a "machine sensible" form—a form which can be sensed or "read" by a machine for the subsequent processing or transmission of this information.

On *Chart 3* are indicated some of the great variety of record media currently used for recording information in "machine sensible" form. This variety exists because of economics, because it is sometimes preferable to use one form of information storage and in other cases a different form. This variety also exists for a good old American reason—that is, keen competition between the business machine companies. This variety doesn't worry the average user too much, because generally within his own organization, all of the equipment is produced by a single manufacturer, for example, Burroughs, Remington Rand, IBM, or Friden, etc.

On *Chart 4* are shown some of the great variety of data processing equipments (viz., computers) which have been built to handle data. These computers can keep information in their memory for indefinite periods in a manner quite comparable to the way filing cabinets and ledger books store information. These computers also manipulate or process information (add, subtract, multiply, divide, sort and merge) in a manner quite comparable to the way that people, working with adding machines or comptometers, process data.

To us communicators, the requirements imposed by business machines are somewhat comparable to our telephone users speaking a variety of different languages, English, French, German, Spanish, etc. Just as our circuits are capable of handling this variety of spoken languages, so are they capable of handling an equal variety of machine languages. Our job is to facilitate these machines talking to each other, each in its own language.

Engineering Problems

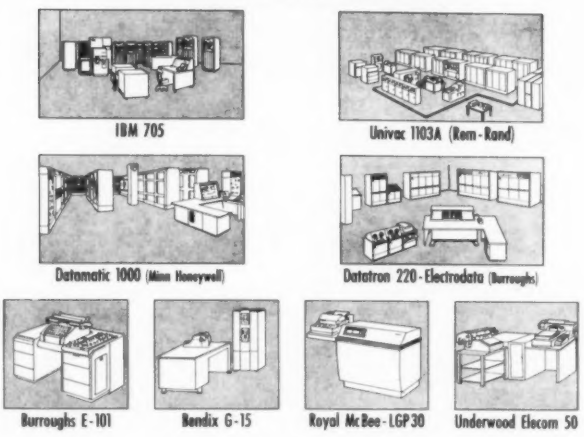
What are the problems associated with facilitating these machines talking to each other? First, the information must be in electrical form (expressed as electrical bits). This is no problem for the business machine people and many of the equipments are already capable of expressing the output of a keyboard in electrical form. Many machines are capable of reading record media (tape, cards, etc.) and expressing the output as a series of electrical bits.

These electrical bits must be conditioned for transmission over telephone circuits.

The business machine people feel, I think unanimously, that it is desirable for telephone companies to accept these electrical bits, to "condition" them for transmission over our facilities, and to deliver bits at the receiving end exactly as they were fed to us at the sending end. A device which does this conditioning is termed a "Dataphone subset." It is, essentially, a modulator-demodulator — converting bits to tones at the sending end and vice versa at the receiving end.

Chart 4

DATA PROCESSING MACHINES



The term "subset" is a contraction of the words subscriber set which we have used for many years to refer to the device which is installed on a subscriber's premises. We use the term with respect to Dataphone service because the Dataphone subset is likewise installed on the subscriber's premises, and further, because of the close similarity of the function which it performs to that of the regular telephone subset.

Just as the telephone subset accepts acoustic information, conditions or converts it to suitable form for transmission over our circuits, and converts it back to its original form at the receiving end, so likewise does the Dataphone subset accept digital information (in the form of electrical bits) and convert it into a suitable form (tones) for transmission over telephone circuits and then convert it back to its original form at the receiving end.

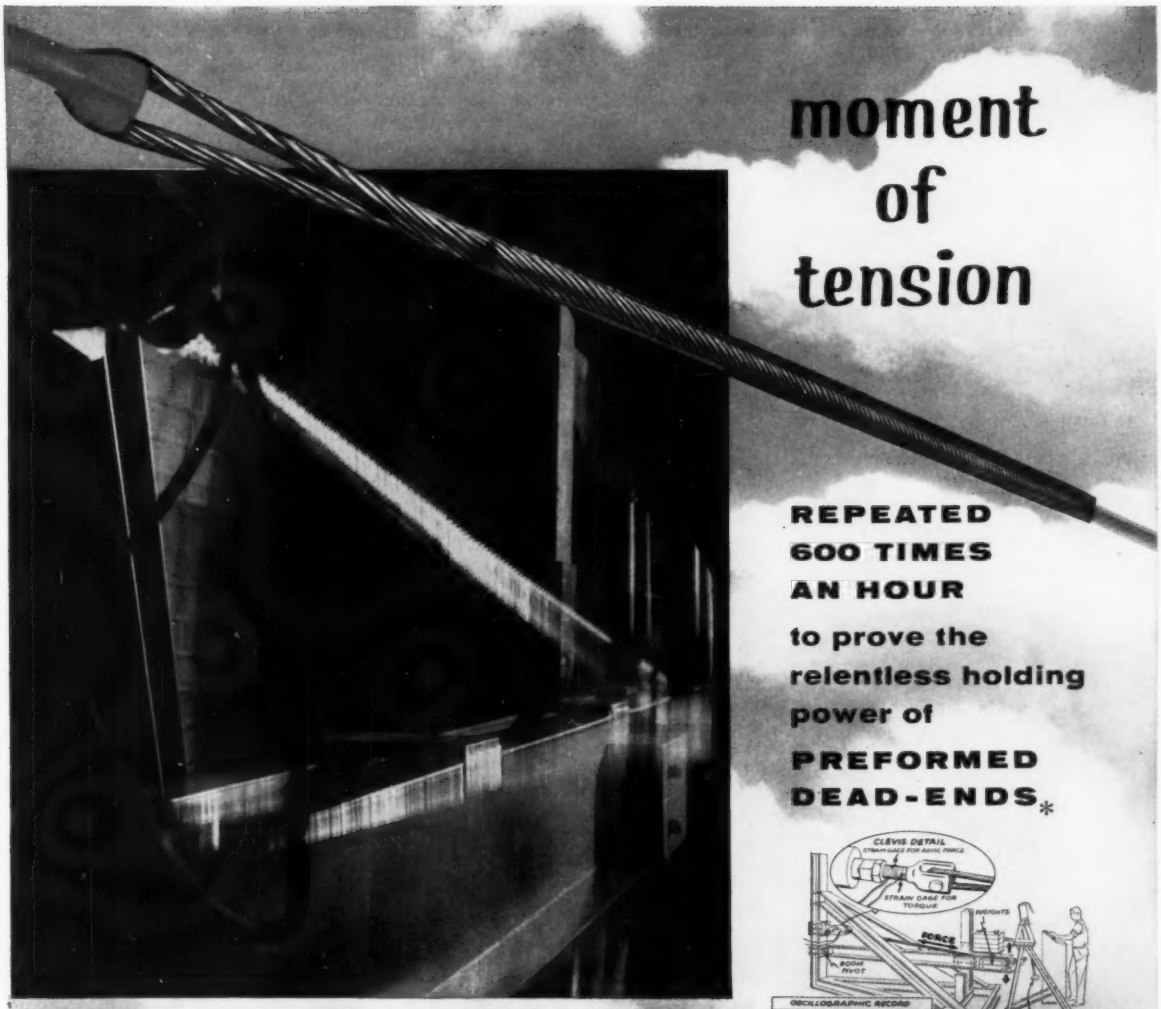
Another reason why it is preferable for telephone companies to provide a suitable data subset is that the subset will not only perform a useful and necessary function, but it can also protect our plant and our other services from excessive voltage, from crosstalk, etc. Further, it will insure coordination with the tone equipment used in central offices for switching control, for supervision, and for automatic message accounting.

Just as we have several types of telephone subsets (wall sets, keysets, etc.) there will unquestionably need to be several types of Dataphone subsets to meet the varied situations and varieties of speed, volume, levels of coding, etc. Whereas a particular subset may be most economic for handling small volumes of data which are being transmitted over short distances, another more sophisticated subset will be unquestionably preferable for handling higher volumes over longer distances.

Another engineering factor of significance is the relationship between the speed capability of business machine equipment and the corresponding bit-rate capability of telephone channels. For example, most data originating devices are keyboard operated and deliver output information at a rate of about 50 to 100 bits per second. This is comparable to teletypewriter speeds. However, the input to most computers is at the rate of about 100,000 bits per second, or higher. Therefore, because the telephone line has a speed capability which is intermediate—between that of many low-speed human-operated devices and that of the input-outputs of electronic computers, it is often desirable to match the speed capability of the terminal to that of the line.

The least expensive and most widely used existing data-input business machines (card punches, cash registers, etc.) are electromechanical in nature; these deliver an output at about 50-75 bits per second. The "recorded carrier" Dataphone subset was designed to accept inputs from such equipment, to store the information until a suitable quantity has been accumulated, and then to transmit it over the telephone circuit at the maximum speed capability of the telephone line. This matching of speeds, to make efficient use of the telephone line, becomes more important at the longer distances.

However, the availability of relatively high-speed telephone lines (as compared with the slower-speed telegraph channels) has an effect on the development of new business machine

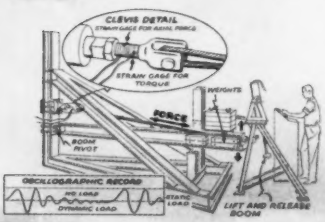


moment of tension

REPEATED 600 TIMES AN HOUR

to prove the relentless holding power of

PREFORMED DEAD-ENDS*



No. 2 of a series...

One of the most exacting responsibilities in development engineering is that of devising equipment which will closely simulate service conditions in a controlled laboratory environment. In the field of conductor and cable fittings, this poses a particularly complex and important problem. Ordinary down-guys, boom-pendant cables, bridge cables, and other similar installations encounter a rather complex combination of tension, torsion, impact, and vibration. These forces acting simultaneously represent a severe and unpredictable stress configuration which does not lend itself to experimentation using conventional test equipment. The cyclic impact machines at the Preformed Research and Engineering Laboratory were created by PLP engineers to gain a better understanding of the effects of these combined forces on cable fittings of all types.

The equipment incorporates a pivoted beam which is raised and dropped automatically by a system of pneumatic pistons and linkages to obtain desired static and dynamic loads in the attached test specimen. Resultant forces are continuously monitored during the load cycle with multi-gage strain cell instrumentation. Once programed, the machine is regulated to cycle continuously and automatically shut down when major physical changes occur in the test specimen.

This unique equipment makes possible one of many rugged test phases in a continuous program which correlates accelerated laboratory testing with field service experience to provide cable fittings of proven superiority.

Jon R. Ruhlman

Jon R. Ruhlman, Vice President
Research and Engineering

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* Made in accordance with or for use under Patent No. 2,761,273; other patents issued and pending.

devices. Already, we observe definite increases in the speed capability of new designs of card and paper tape reading-punching equipments, thus bringing them closer to the point where they can make optimum use of telephone lines—without an intermediate buffering "speed change" device.

At the other end of the speed spectrum, both the input-outputs of computers and the normal operating speeds of associated magnetic tape units, are considerably higher than the bit rate capability of telephone circuits. Even if we are able to design sophisticated Dataphone subsets which permit the transmission of as high as 2,000 bits per second over a voice-band facility, this is still very slow compared to computer speeds. A typical computer tape unit operates at about 50,000 bits per second. The internal operating speed of computers is, of course, much higher than this, but we communicators need only concern ourselves with input-output speeds.

When computer designers, sometimes not experienced in communications, first begin to think about the communications aspects of an over-all data system, often they initially think that they would like to use very high speed (video) facilities between all locations. Of course, as they analyze the economics, they realize that this would be impracticable. For one thing, data originating devices are essentially slow speed. Buffering (temporary storage) is the answer—and it is most economic to provide this on a centralized basis.

Further, centralized controlling, scheduling and programming of the loads that are applied to computers is often desirable. For such systems, batch transmissions are most economic. For "in-line" or real-time data systems, it is likewise most economic to employ moderate speed data transmission with buffering at the computer input-output.

In instances where the volume of data to be transmitted within a given time interval exceeds the capability of a voice line, several voice lines may be used simultaneously. For example, the end-of-week or end-of-month accounting balances may involve large volumes which must be transmitted in a brief time interval. Dividing the load into several batches and using several "dialed-up" telephone circuits simultaneously, will provide the required traffic capacity.

Dataphone Trials

The more that one examines the needs for data transmission, the more is he impressed with the seemingly endless variety of needs. This variety gives an undue impression of immense complexity—a complexity which I am sure will yield a simplicity, once we understand all the problems and have gained some experience. It's your traditional job, as telephone engineers, to simplify the complex. One of the best ways to achieve this goal is by means of a "trial" program involving actual customer usage of data transmission arrangements. A fundamental factor which practically forces this conclusion is that in providing data transmission service, telephone companies will be connecting to customer-provided data terminal equipment. Trials afford an opportunity for the business machine designers and the telephone company engineers to work together and to influence each other so as to make the over-all result most economic for their mutual customers.

Just as we must adapt our telephone subsets to the personal likes and usage characteristics of the people that talk over our circuits, so must we, in designing Dataphone subsets, be sensitive to the business machine needs and requirements, and the effects of these upon the design of our subsets.

In order to "get started" and to test the reactions of both the business machine companies and the using customers, telephone companies launched their Dataphone trials with two types of subsets—the digital subset and the recorded carrier subset.

The Bell Laboratories designed, on a "back of the envelope" basis, both the digital and recorded carrier subsets. Following is a brief summary of the features and capability provided with these initial model shop units:

The *digital subset* is capable of accepting electrical bits ("dc pulses") over a single input circuit at any rate up to a ceiling value. This ceiling value is dependent upon the transmission characteristics of the circuit with which it is used. In the case of the regular switched telephone network, 600 bits per second is the current figure; for private lines, 1,000 bits per second. The digital subset is essentially an f-m modulator-demodulator. It converts bits into tones at the transmitting end and vice versa at the receiving end. Each subset is capable of transmitting and receiving, but is not arranged to do both simultaneously.

The *recorded carrier subset* likewise accepts data in the form of bits. However, instead of transmitting directly to the line, it stores these bits (as tones) on magnetic tape. After a suitable quantity has been accumulated, the attendant then places a telephone call and transmits the information at a speed equal to the capability of the telephone line. In practice, recording takes place at (any speed up to) 75 bits per second and transmission is eight times faster—nominally 600 bits per second. The reverse process takes place at the receiving end.

At the outset, it was recognized that the recorded carrier subset, with its magnetic-tape "speed changer" capability, includes some features which ultimately might better be provided by the business machine companies. However, it was felt that, for exploratory purposes, it would be desirable to include this capability in order to help both us and our business machine friends to achieve a better understanding of the feasibility of matching the speed capability of low-speed equipment to the bit-rate capability of telephone lines.

The Western Electric Co. built 100 of each of these subsets in their model shop. About two-thirds have been placed in service—roughly half on customers' premises and half on telephone company premises for official trials. Most of the remaining subsets have been committed and will soon be in service. Tariffs have been filed in about half a dozen states (New York, Michigan, Illinois, California, Pennsylvania and Delaware) and with the FCC.

Independent telephone companies have already been included in these trials. As time goes on, they will play an increasingly active role. Many customers, have community-of-interest data transmission needs, will have some locations in Independent territory and some in Bell territory. There is certainly nothing monopolistic in this data transmission business. It's an industry problem.

For the initial trials it has seemed most appropriate, in the interest of simplicity, to make arrangements for Western Electric Co. model shop subsets to be available for use by the Independent companies. However, as Dataphone service grows, it will certainly be desirable for the Independent manufacturers to provide subsets which will be compatible with similar subsets throughout the entire telephone industry. Several of these manufacturers are actively working on subset designs, not only with the view of being able to provide units which will be compatible with Western Electric Co. units, but also doing exploratory development on other features and arrangements which will be attractive in the long run.

Results of Trial

Some things are already becoming quite clear as a result of the limited trials which have been under way for only a very brief period of time. Customers have enthusiastically greeted the idea of high-speed data transmission over regular telephone facilities. However, their immediate applications have been restricted by the limited availability of business machine equipment which can be connected (without major modification) to the model-shop subsets now available.

One of the most important results has been the reaction of the business machine companies. To them, the Dataphone capability has appeared as a newly available and highly attractive possibility.

As a result of the telephone company's adoption of the "Dataphone concept," the business machine companies are left with a large area of freedom and flexibility to design their equipments to meet the market which

each visualizes as most attractive. This is an example of our American "free enterprise" system at work. From it, customers will, undoubtedly, accrue many benefits which would not result if the telephone industry were trying to force data transmission into a rigid set of standards—codes, speeds, word lengths, pattern of redundancy, etc.

Maybe some standards will develop; maybe there will eventually be several families of standards. If they develop naturally, that is fine. But, it is a severe burden on progress when rigid standards are imposed on a new art before the desirability of standards has crystallized.

A number of the business machine companies are now designing new equipment or modifying their existing equipment so that it may be connected to Dataphone subsets.

The program planning people in the business machine field tell us that they are certain of a big upsurge, both in their sales of processing equipment and in the related needs for data communications. Several have expressed the view that, while they have been able to get along with very meager data transmission arrangements, by 1960 it will be necessary for them to have data transmission arrangements available—from "off the shelf."

Another important result of our trials has been to clarify, in the minds of many people, the inevitable division of responsibilities between the communication companies and the business machine companies.

Many of you will recall that over the past few years there has been much loose talk about how communication companies had not lived up to their responsibilities in providing for data transmission. Much of this talk implied that communication companies should be in a position to read computer magnetic tapes and transmit the data over their lines and produce punched cards or tape at the other end of the circuit. I am sure that when you recall the great variety of punched paper tape, magnetic tapes, and punched cards which are used as record media, you will immediately appreciate the impossibility of common carrier communications companies being responsible for the reading and reproducing of this expanding variety of record media.

Another of the very tangible results of our present trial is that we are finding our existing telephone plant is eminently capable of handling data transmission.

Of course, there are some connections over which data transmission is not satisfactory. This is in about the same percentage of calls and over the same connections as those in which ordinary voice communications is not satisfactory. My friends in transmission engineering tell me that the provision of Dataphone service is like "putting a thermometer in the patient's mouth." It imposes no unreasonable requirements on the transmission path. But, it does clearly indicate its condition. It shows up, more definitely and clearly than voice communications, any situations which should be corrected.

We do not have to change our plant design objectives, but Dataphone does point up any cases where these objectives are not met, or where the plant maintenance is not up to par. Dataphone requires only that we maintain our plant in such a condition as to insure thoroughly satisfactory telephone service. By properly designing the Dataphone subsets, it is possible (and practical) to insure satisfactory data transmission over any connection which is satisfactory for voice communication.

What about transmission errors? In data transmission, of course, no communication facility can be expected to be error proof. However, in transmission, as in data processing, it is entirely practicable to use error control procedures to obtain any desired degree of accuracy.

The transmission error rate over regular telephone circuits is proving to be such that, for many applications, no transmission error control is required. The transmission error performance is at least 10-fold better than that of the average keyboard operator.

However, for some applications (viz., the transmission of verified or processed data) a very high degree of accuracy is required and some form of error control is indicated. The situation is analogous to the problems involved in the use of magnetic tape with computers. Since the tape is a potential source of errors, systematic redundancy is added to the data as it is recorded on the tape. Subsequently, as the data is read off from the tape, this redundancy is used for error detection and correction.

Both from the trials and from considerable laboratory work, we are learning much about several kinds of transmission error control. The selection of a method, in any particular case, is dependent both on the customer's (business machine) requirements and on the statistical characteristics of the transmission errors (both their rate and distribution). We have not yet, however, learned enough to have a clear picture of whether error control arrangements should best be included within the subset, or within the design of the business machine terminal equipment. There will surely be some cases where the latter is desirable.

Another result of the trial is something which I think we all knew before we started but which has become very clear—it is that the design of the telephone company-provided subsets should lean very heavily in the direction of simplicity. While we must learn to live with ever increasing complexity in our central offices—the electronic central office, for example—the trials indicate that we should strive to provide increasing simplicity on the customers' premises.

Future subsets should be both simple and rugged—reasonably trouble-free. Further, they should include simple-to-use testing arrangements which will permit the test desk to determine whether reported troubles are in telephone company or business machine equipment—without having to dispatch a repairman. The design of such a test arrangement is, of course, a function of the design of the subset and its capability. It is not expected that the provision of this adjunct—to simulate customer's equipment—will add significantly to the cost of subsets.

New Dataphone Subsets

The next question is how to interpret these trial results and some of these conclusions into future actions? One obvious step is to design new and improved subsets based upon the knowledge obtained from the trials.

A Dataphone subset which is now in exploratory development at the Bell Laboratories will perform a function quite similar to the present digital subset except that its input-output will be on a six-wire "parallel" basis rather than on a one-wire "serial" basis. That is, it will accept six bits simultaneously and transmit them in a parallel manner on different frequencies. This will simplify the job of the business machine designers. Furthermore, this is a very simple subset. At the sending end, it uses only one transistor and gets its power from a "talk battery" supplied from the central office.

How can things be so simple? As usual, only as the result of a lot of hard work. In this particular case, the designers of the Dataphone subset have been able to utilize the fundamental principles which resulted from a large amount of work which the research people had previously done on push-button calling. Now both Dataphone service and push-button calling will benefit. This is an example of the value of basic research, costly though it is.

This new subset has not been given a name yet, perhaps it will eventually be called a version of the digital subset. However, for want of a better handle, the designers now refer to it as the "TOOT" subset. The name TOOT comes from the fact that the subset utilizes a Three-Out-Of-Twelve transmission system.

A total of 64 possible code combinations are available with the three-out-of-twelve system. Although this seems adequate to meet most needs, several business machine companies have expressed an interest in transmitting a seven-bit code, including the seventh bit as a redundant parity check bit. Further, there are some cases in which information is currently recorded on eight-bit tape. Therefore, it appears desirable to investigate the economic feasibility of providing a subset which has the capability of accept-

(Please turn to page 124)

The Accident Sequence and How to Control It

*By R. N. PAPICH**

(A Plant Conference Address)

I HAVE BEEN asked to brief you on one unit of the American Gas Association's Accident Prevention course for supervisors, entitled "Accident Prevention Through Informed Supervision."

In order to give you an accurate picture it is necessary that you know just a little about the American Gas Association and its functions. The American Gas Association is a trade association formed by members of the Gas Industry to pursue common interests more effectively and more economically than could be done by members themselves, working either as individuals or as separate smaller groups.

The American Gas Association now ranks as the 6th largest national trade association in the United States. The Association serves nearly 400 gas company members, which, in turn, serve 9 out of 10 of the nation's gas utility customers.

Its membership consists of gas utility, manufacturer, holding, service and other companies and nearly 7,000 individuals.

ORGANIZATION

The American Gas Association has five sections, each headed by a Chairman and Managing Committee. These sections are:

1. The Accounting Section considers and deals with accounting and related matters.

2. The Industrial and Commercial Gas Section considers and deals with matters relating to developing the use of gas and promoting the sale of gas and gas appliances and equipment for industrial and commercial purposes.

3. The Operation Section considers and deals with matters relating to producing, gathering, manufacturing, storing, transmitting, and distributing gas and by-products.

4. The Residential Gas Section considers and deals with matters relating to developing the use of gas and promoting the sale of gas and gas appliances and equipment for residential purposes.

5. The General Management Section considers and deals with other matters of a management nature.

Our Accident Prevention Committee is part of the General Management Section. This committee is composed of 40 members who are representative of the different segments of the industry as well as representative geographically of the United States and Canada. This committee meets on the average of twice a year and holds a Conference annually for the promotion of safety within the gas industry.

Now, what I am to talk to you about is the Accident Prevention Committee's thinking on what constitutes part of the desirable background and knowledge that a supervisor should have in Accident Prevention in order to do an adequate job in the prevention of accidents in the gas industry. I might add that it took several years to come up with the course content for this particular course and that the material used was selected after a long and tedious review of material in the Accident Prevention field.

Gentlemen, we might as well face a very disagreeable and disturbing fact.

It is this: whenever a worker is hurt or property is damaged, the real cause —however remote it may appear—is generally the failure of a *supervisor* in one or another of his duties.

Somewhere along the line the superintendent, the supervisor or foreman has failed to show—failed to train—to explain—to convince—to safeguard the worker—to repair or improve equipment—or to use foresight.

This doesn't necessarily mean carelessness or laziness on the part of supervisors. On the contrary, most supervisors do everything they know to prevent accidents. So it is obvious that those who supervise need more training if they are to become more effective in preventing accidents.

Accident prevention is your concern if you are one of those who supervise personnel in the public utilities industry —whether you are a superintendent, supervisor or foreman—or in any way responsible for the activities of others.

Some may ask, "Is it important?" Well, one reason why those who supervise earn more is because they are *expected* to look after the safety and welfare of others and to keep accidental losses at the minimum. Therefore, it *is* important! But most important—we know that accidents can be prevented, because when those who supervise bear *down, accidents* go down and when they let up, accidents go up. However, there is a bright side to the record. Accidents have been reduced because a lot of you who are responsible for supervising personnel, have done just that. Whether in a gang, department or division, accidents tend to reflect the effectiveness and efficiency of the over-all operation.

Before I go on any further, I want to call your attention to W. H. Heinrich's "Foundation of a Major Injury".

The report of the USITA Plant Committee Chairman P. N. Malmgren will be published in a later issue.

*Mr. Papich is Safety Engineer of American Gas Association, New York City.

Through laborious and detailed analysis of more than 75,000 accident and injury reports from one industry, Mr. Heinrich found that in a unit group of 330 similar accidents 300 will produce no injury whatever, 29 will result in only minor injuries and 1 will result in a serious or major injury. The major injury may result from the very first accident or from any other accident in the group.

Now let's transpose this concept to the General Telephone Company experience because I do not have data on all the United States Independent Telephone Association members. I wonder how many have any idea of the accident experience it takes to have 636 disabling injuries a year. Do you realize that there were probably 18,444 First Aid or medical treatment cases experienced by company employes, and to have these 19,080 injuries there were probably 190,800 accidents.

This is the point I want to make —the supervisor (1st line) is in the best possible position to prevent these accidents from happening. He is on the "firing line" where they happen. Here is where he should direct most of his effort, prevent the accidents and the injuries will take care of themselves.

I've been talking rather glibly about accidents, now just what do we mean—

As you know, accidents are unintended events that interrupt normal procedures and may result in injury or property damage.

By the way, how many of you believe —"Accidents are inevitable. People are going to get hurt or killed regardless of what you do about it."

But there is a lot that we can do about it.

Now the same thing has been said about disease, crime, drought, flood, and other plagues of humanity. But great gains have been made despite pessimism. What we do know about accident prevention is helpful. We know, for instance, that no one really *wants* or *expects* to get hurt.

We know that all accidents, including those due to supervisory failure follow a definite pattern. I would like to call your attention to its sequence. There are a number of factors. We will illustrate them as dominoes. Incidently, what I am about to show you is based on H. W. Heinrich's Basic Philosophy of Accident Prevention and his "Accident Sequence" presentation.

HEREDITY

Heredity or ancestry is the first block that I want to talk about. This is usually an underlying cause and represents the qualities with which we are born. It pertains to inherited traits or characteristics such as:

Left to right: H. B. Flower of Wisconsin Rapids, Wis.; R. J. Riordan of Madison, Wis.; Truman Wood, Mrs. R. C. Boecher, Mr. Boecher, all of Kingfisher, Okla.; E. J. Murphy of Elmhurst, Ill., and W. M. Driggs of Springfield, Ill.

A. Physical Qualities
   1. General build (big, small, strong, etc.)
   2. Faculties (eyesight, hearing, etc.)

B. Mental Qualities
   1. Intelligence
   2. Excitability, nervousness
   3. Calm and methodical

Now there are many other causes acquired through social environment or previous working experiences.

BEHAVIOR

The second block I want to talk about is behavior. When we talk about behavior we are talking about actions that are acquired. We are not born with them. This is considered a fault of person and such actions are:

A. Have the proper attitude or have the improper attitude.

B. Follow instructions or be a chance-taker.

C. Be a willing learner or think we know it all.

These two representatives of Everstick Anchor Co. are R. K. Eaton (left) and D. J. White.

D. Keep our minds on our work or daydream.

E. Plan our work carefully or short-cut.

Common faults included in human failure are: forgetfulness, inattentiveness or thoughtlessness. These factors may be attributed as being distant causes in accidents.

UNSAFE CONDITION

Now the third factor that I want to talk about is the unsafe condition. This is one of the key factors and may be a direct cause.

Unsafe conditions are:

A. Improper Guarding
   1. Unguarded, inadequately guarded or guards removed.

B. Defective Agencies
   1. Broken or poorly designed, slippery, defective, rough, sharp, decayed, corroded or frayed.

C. Hazardous Arrangement or Process
   1. Piling, storage, aisle space, exits, misalignment, improper or no grounding of live circuits.

D. Improper Illumination

E. Improper Ventilation

F. Improper Dress
   1. Loose clothing around moving machinery.

UNSAFE ACTION

The next factor is the unsafe action. This is the most direct cause of nearly 88 per cent of all accidents. A number of unsafe acts that come to mind are:

A. Operating without authority.

B. Operating or working at unsafe speed.

C. Making safety devices inoperative.

D. Using unsafe equipment.

E. Assuming unsafe position.

F. Horseplay.

(Please turn to page 154)

New Methods

*By C. H. BEHRENS**

(A Plant Conference Address)

BY DEFINITION, the word method has come to mean an orderly procedure or process. The word is derived from two Greek words meaning after and way. The word after implying that an investigation is required, thus a way after investigation. Our concern today is to find better and more economical methods for construction and maintenance of outside plants.

As we all know, the costs of labor and materials are steadily increasing. The telephone industry must compete in the same labor market as other industries. These industries are offsetting increased labor costs by increasing their production. One of the country's largest electrical manufacturers has stated that, in view of the present trends, by 1965 they will be faced with the necessity of increasing their production 40 per cent with only a 14 per cent increase in manpower.

Since our only product is service, and our volume of business is directly proportional to the service we render, we cannot possibly curtail service to economize. Nor can we cut plant maintenance without endangering our plant investment. The answer to this dilemma is devising new methods of operation, construction, and maintenance that will provide a greater utilization of manpower. New methods must be devised, such as the mechanization of present hand methods and the simplification of existing practices where it is proved less costly.

"Where proved less costly" is a most important consideration. Mechanization is wonderful and very impressive and provides a sense of pride in owning mechanized equipment. These results however, do not contribute to saving costs, but contribute to costs. The use of mechanization to provide employes with more free time cannot be construed as increased efficiency.

A vital part of any program to increase production by adopting new methods is a knowledge of present costs and the productive hours used to perform a given job. Costing methods must also be available to make certain that anticipated savings are realized when a new method is used.

An example of operating economy is illustrated by the experience of several companies that have adopted fleets of foreign-made automobiles and trucks. These companies have realized substantial savings. Their gasoline and oil consumption has been halved, tire mileage has been increased substantially, the use of air cooled motors has eliminated expenditures for antifreeze and repairs on radiators, water pumps, etc.

One company has been able to reduce its maintenance costs from nine cents a mile to under two cents a mile. The use of vehicles of about half the weight of vehicles formerly used has cut down on their insurance and licensing costs. They have found that their employes like the lighter vehicles and find them easier to drive. They are using a fleet of small automobiles in the maintenance and inspection of micro-wave installations that were inaccessible to conventional cars. These companies felt that they were paying too much for unwanted horsepower, unnecessary gasoline consumption, high insurance, and expensive maintenance. In view of the large savings that can be effected by using small vehicles, it is to be hoped that our manufacturers will meet the challenge and produce similar vehicles soon.

In another field of transportation, very substantial savings have been realized by having poles delivered directly to construction sites by pole suppliers or truckers. This method not only provides a saving in direct costs, but also reduces indirect costs by eliminating large storage yards and investment for adequate stock and yard maintenance. The high costs of present methods are eliminated, such as the use of highly paid construction crews and expensive construction equipment for pole transporting. With the supplier doing the transporting, crews are not tied up transporting poles and are available for actual construction work. The transportation of poles to construction sites is only the beginning of the outside plant field where new methods can be used to increase production.

The advent of one-man splicing has opened fertile acres. Economies obtained in the use of this method are readily apparent. Efficient use of one-man splicers can, however, only be obtained when the splicers are provided with the proper tools and methods. Methods must be carefully worked out and personnel should be properly trained. Many companies have been disappointed by the results obtained from the use of one-man splicing. The poor showing obtained was, in most cases, the result of the use of improper tools and methods. The introduction of prepared splice closures has made one man splicing more economical than ever. With splicing time reduced, the use of platforms and associated rigging is being replaced with ladders and detachable seats. Ladder clamping devices are now available at reasonable costs, making for easy use and safety.

A newcomer in the way of tools is hand lines made of plastic. These lines are said to be much lighter and stronger than conventional rope with an unlimited life under normal use.

*Mr. Behrens is Chief, Telecommunications Division of Renwar, Inc., New York City.

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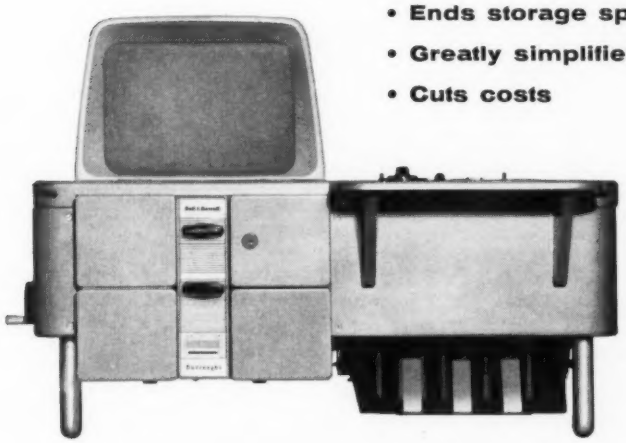

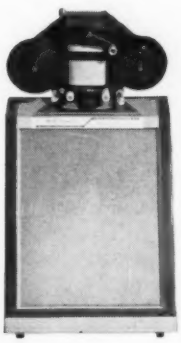

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You'll want complete information about the *only* truly up-to-date combination microfilm recorder *and* reader that offers such a *low-cost* answer to your every microfilming need. Yes, in a single unit that costs less than you might expect to pay for a recorder alone! Separate recorder, separate reader available at low cost, too. So get in touch with our nearby branch or write to Burroughs Corporation, Detroit 32, Michigan.

Bell & Howell MICROFILM EQUIPMENT — SOLD AND SERVICED BY Burroughs

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Pole line hardware has seen many new additions recently. The use of preformed grips for suspension and deadending has proved to be a time saver. These grips are rapidly replacing the multitude of clamps previously used. Power impact tools are now available for cutting strand cleanly and instantaneously. The list is almost endless. An awareness of the availability of material and proper application thereof, coupled with one's own ingenuity may be the beginning of a new method that will save your company money.

As plastic cables are much lighter than those formerly used, some companies are now devising methods for pre-spinning cable before hanging. This method should appreciably reduce construction time with resulting savings in costs. Plastic cables with the suspension strand laid parallel to the cable and covered with a sheath of weather resistant polythene in a figure eight configuration are now being used in Europe. Use of cables of this type simplifies construction even further as it does away entirely with the necessity of spinning and permits hanging directly from the reel.

During the past year the use of buried plastic cables has increased tremendously. The use of pedestal mounted terminal boxes has found wide acceptance for use in suburban areas. The availability of simplified ditching machines and plows for use in these applications has simplified this type of construction. Ditching machines that can dig trenches up to three inches in width and to depths of four feet can now be obtained. As these machines are simple and light in construction, they can be operated by one man. They are designed so that they can be used in confined areas and can ditch right up to foundations. Large suburban housing developments have proved to be a very fruitful area for buried cable applications. In these housing developments, cables have been buried inside of property lines and with terminals set to obtain maximum distribution. Fears of public tampering with accessible terminals have in practice proved to be unfounded. Terminals can be obtained as one piece units with the terminal box mounted directly on the pedestals. They can be obtained in weather and flood proof models. The flood proof models will be of particular interest in areas where flash floods are prevalent.

Left to right: Cy Kurtz of Dundee, N. Y.; E. C. Cole of Aurora, Ore.; DeWitt T. Talmage of Chicago, and W. R. Adwell of Glasgow, Ky.

Great strides have also been made in the field of cable protection. Many new automatic gas control and leak detectors are now available. The cost of air de-humidifiers has been decreased as production of these units has been increased. These units are now economically feasible for small exchanges. The use of air units allows greater freedom in locating leaks. These units supply dry air continuously under pressure so there is not the expense of losing costly gases while locating leaks. In the case of very small leaks, the cable can be kept under pressure continuously and the leak found at leisure.

European systems have brought the use of radioactive tracer gases for leak detection to a very practical stage. When a cable leak occurs, Radon Gas is inserted into the cable by means of an ampule. The ampule is inserted into a fine metal mesh which is in turn inserted into a plastic hose. The hose is inserted into the nitrogen plumbing. The ampule is broken by squeezing with a pair of pliers. The required amount of gas is allowed to flow into the cable and the leak is detected with a Geiger Counter. No problem of personnel exposure to radiation has been encountered as the amount of radioactive gas used is very closely controlled and fault location is done by trained personnel.

Fault detection in cable pairs has also been improved. One man cable testers are now available. Use of these testers has been found to be very economical. A small "silent buzzer" has been developed to eliminate interference with working lines when testing working pairs. Since monitoring of busy lines is eliminated, savings in testing time is obtained.

With the introduction of truck engine mounted generators, a whole new field of mechanization of hand operations is opened. All construction operations that have been done by hand can now be mechanized. By making available 110 or 220 volts at the pole site by means of a generator driven by the vehicle engine, all types of electrically driven tools will be available for construction crews. Only one's ingenuity will limit these applications.

Only a few of the many methods available have been mentioned. These examples can only serve as a guide to better operating methods as the economics of each will vary from organization to organization. As mentioned previously, every existing operation can be performed more efficiently and more economically. Standard methods, that have come through the years, were undoubtedly the best when originated, but as time passes advances in related fields often make these so-called stand-

(Please turn to page 157)

Left to right: P. H. Kaufman of Bellevue, O.; Mrs. Kaufman, and W. E. Lyon of San Antonio, Tex.

Rings the bell

The Volkswagen Panel Delivery Truck is just what the budget ordered for busy telephone companies. It has a capacity of 170 cu. ft. and carries a payload of 1830 lbs. Loading space is easily accessible from side or rear. Special racks and bins for tools and equipment can be easily installed. Outstanding gas economy and low operating cost mean that the bigger your fleet, the more you save.

The economy and dependability of Volkswagen performance are backed up by the VW service organization. Every mechanic is kept up-to-date through a continuous factory service training program. Speed in servicing is assured by immediate availability of Genuine VW Spare Parts through 370 completely-equipped service centers covering all 49 states.

Ask your Volkswagen dealer to show you operating costs for a Pick-up Truck, Panel Delivery, or Kombi Station Wagon. He will prove that Volkswagen savings add up mile by mile and year by year.

VOLKSWAGEN

VOLKSWAGEN DELIVERS THE GOODS...FOR LESS!

Sales by Plant Forces

By F. MARK CLARK*

(A Plant Conference Address)

IF I TAKE Chairman Malmgren's word for it, many of you are not completely happy with the results you are getting in your plant sales projects. If this is true, it gives me great comfort, for, to put it very mildly, neither are we in Rochester. In fact, at the very time when Mr. Malmgren asked me to appear here, we were taking ourselves to task for our failures in this field. Since then, we have reached certain conclusions, and have taken definite steps to implement our ideas in the hope that better results will be forthcoming.

We had not gone far with the analysis of our failures before we found ourselves in the same frame of mind as the farmer who refused to join the farm bureau to learn how to farm better, because, as he said, "He wasn't farming as well as he already knew how." In other words, we concluded that we know how to do a better plant sales job than we are now doing. In the next few minutes, I am going to expose you to our thinking about this problem and to the steps we are taking to improve the performance of certain of our plant employes in the field of selling.

At the outset, we decided to define our objective. We concluded that, for this purpose, our only concern is with face-to-face selling done on the job while completing service orders and repair service assignments in connection with residence service. It will be seen from this that sales made by plant employes whose work does not require personal contact with residence customers will not be included in the plant sales results. To be more specific, our objective is to increase the number of sales made by installers and repairmen which would, of course, include those made to residence customers at the time of set changes while preparing for dial cutovers.

It may be well at this point to explore briefly the reasoning behind our decision to confine our objective to selling residence customers, and I would like to make it clear that, under different circumstances, we might have reached another conclusion. In our case, however, the number and size of the business establishments we serve make for a situation where the installer or repairman will not, in most cases, have contact with the individual who can make the decision to buy. On the other hand, when he is in contact with the principal, the sale of an extension or some other minor item might delay indefinitely the sale of a system better suited to the customer's needs.

We then spent time analyzing our reported results. We found that our reports told us who made sales and how many. They also told us that sales performance was spotty—a few men made most of the sales and a great many made none. This review also brought to light that some men did very well for awhile and then suddenly became non-producers. Our reports, however, did not provide any explanation for the variation in performance.

For this reason, we decided to talk with the men to learn how they felt about selling. As you would expect, some thought it was a good idea. However, investigation revealed that many of these were not selling. Some felt that they were not competent, or that they had not received adequate training for selling. For the most part, this group had tried and failed and had become discouraged. Others were openly resentful. These seemed to be hurt by the idea that their technical skills were not sufficient to sustain them.

After this, and much more soul searching, our group concluded that the whole project could be sabotaged by trying to do too much at one fell swoop. In other words, this seemed to be a spot where dividends would be paid by making haste slowly. Accordingly, we agreed on the following few principles which we feel will get the show on the road and which are sound enough to build up in the future:

(1) Make the sales job for installers and repairmen simple.

(2) Establish a unit for measuring their performance.

(3) Revise the reporting procedure to reflect both quantitative and qualitative performance.

(4) Fix the responsibility for performance in supervision.

(5) Recognize that top management must—

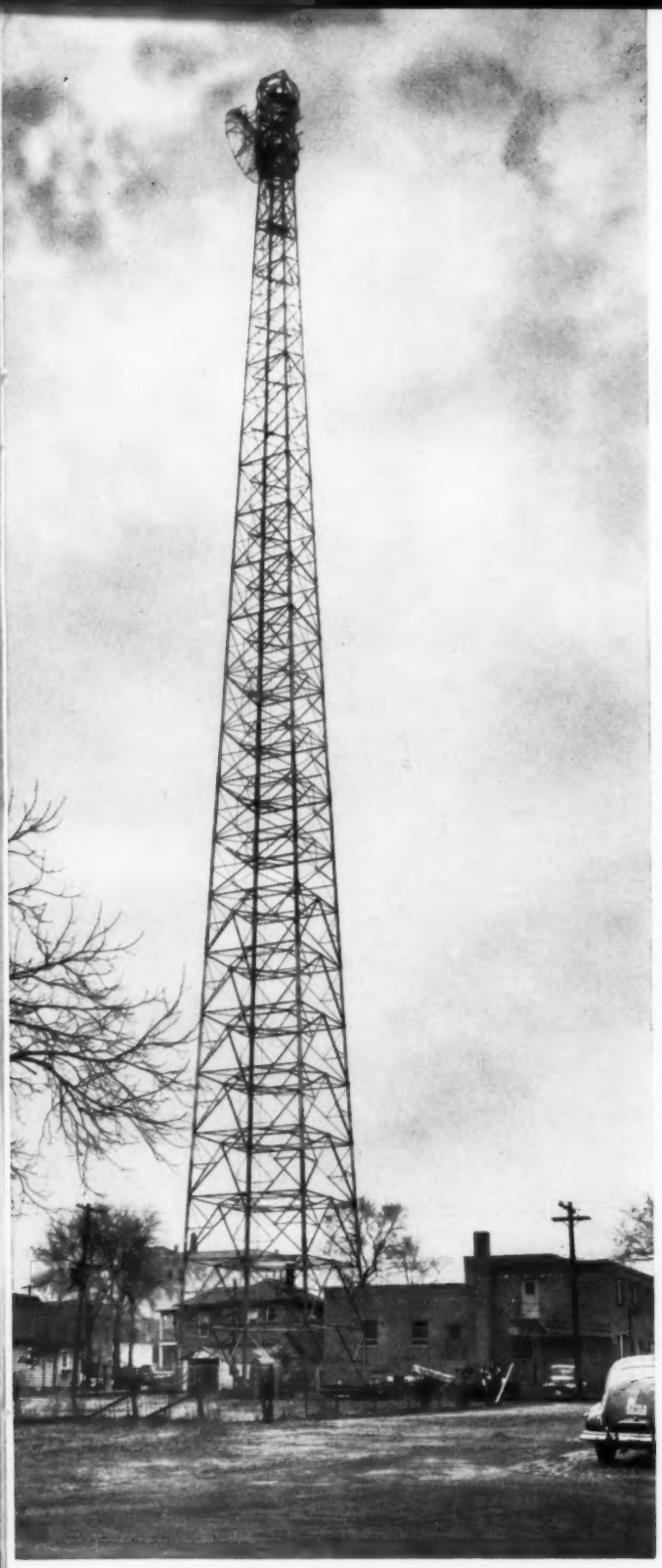
(a) Set standards.
(b) Insist that standards are met.
(c) Provide the logical and psychological inspiration.

On making the job simple we believe that success in plant selling, as in any other kind of selling, depends upon asking for the order. . . .

In line with this thought, we believe that installers and repairmen must be required to ask for an order on every visit regardless of the apparent need or lack of need for an item. In other words, whether the dwelling is spacious or small, on two floors or one, the installer or repairman is required to ask for an order. This approach simplifies the task by removing the element of decision making. No doubt, you recall the story of the farm hand who was quite pleased with his job until he was asked to sort potatoes, then he quit, because there were too many decisions to make.

(Please turn to page 90)

*Mr. Clark is Commercial Superintendent of Rochester (N.Y.) Telephone Corp.



This 300 foot self-supporting tower, located at the rear of new central office building, requires minimum space. Tower design meets rigid standards for safety, wind loading and quality of construction.

Signalling between Marion and Harrisburg this dish is mounted for 360 degree orientation . . . is easily positioned for any future change in signal path. Ring mounts will also simplify installation of additional antennas as the system grows.

at Marion, Illinois . . .

General Telephone goes microwave with a Blaw-Knox tower

In extending their toll system and converting to customer intertoll dial operation, General Telephone of Illinois chooses microwave as the cost cutting answer to today's needs, tomorrow's expansion.

Like so many companies in the General Telephone system turning to microwave, they chose a Blaw-Knox tower. And Blaw-Knox, for over 40 years, has been building towers that keep pace with the future. This tower, like all Blaw-Knox towers for communications, is tailored to *established* specifications, built to *individual* needs.

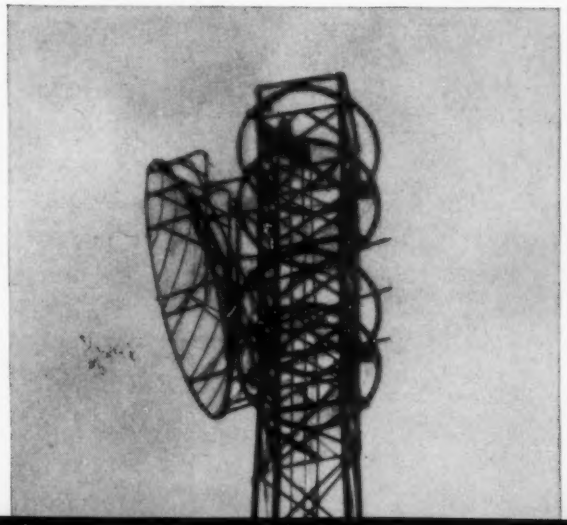
Blaw-Knox's Microwave Tower Booklet covers the unique advantages of microwave service, and outlines a complete service that ranges from tower design through fabrication and erection. Write for Booklet 2538.

Microwave Towers—guyed and self-supporting towers for microwave, AM, FM, TV, radar and communications . . . transmission towers . . . parabolic antennas . . . special structures.

BLAW-KNOX COMPANY

Equipment Division • Pittsburgh 38, Pennsylvania

BLAW-KNOX

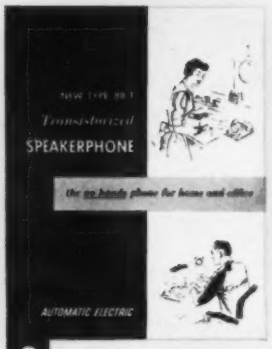


1

TELEPHONE CATALOG
Shows complete line of Automatic Electric telephones for home and office, and telephone accessories. Full ordering information. 24 pages.

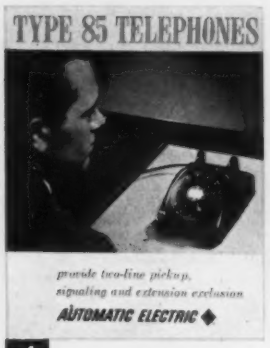
2

TELEPHONE SALES KIT
A complete merchandising package. Includes ad mats, radio commercials, press releases, display ideas, envelope stuffer and merchandising guide.



3

SPEAKERPHONE
Gives full information on our new transistorized Speakerphone for home and office. Explains why it installs like a regular phone. 4 pages.



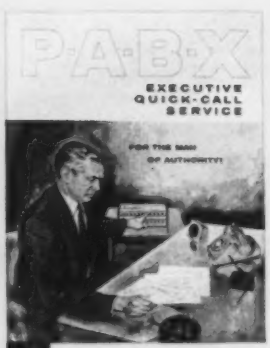
4

TYPE 85 TELEPHONES
Describes three models of the Type 85. Tells how to provide two-line pickup, signaling and extension exclusion for your business subscribers. 4 pages.

16 ideas to help you

9

P-A-B-X SALES KIT
Includes everything you need to promote P-A-B-X. Selling plan, sales letter, catalog, sales literature, survey form and proposal —even a contract!

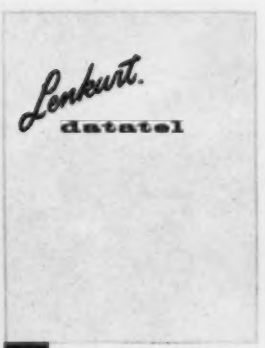


10

QUICK-CALL SERVICE
Quick-Call is an auxiliary service for P-A-B-X. Permits an executive to contact key men at the push of a button. Designed for personal selling. 4 pages.

11

ATTENDANT CABINETS
Shows our most popular P-A-B-X attendant cabinets. Includes the new Type 51 with Trimline Styling. Designed for personal selling. 4 pages.



12

TELEGRAPH CARRIER
Summarizes Lenkurt's new Type 23A fully-transistorized telegraph carrier, applicable to all known office and subscriber arrangements. 4 pages.

Here are 16 recent circulars published by A.E. for the telephone industry. This literature offers you a wealth of new ideas...ideas that help you increase revenue and reduce operating costs. Write for your free copy of any of these circulars. Just fill out the coupon at right and mail today.

AUTOMATIC ELECTRIC

Subsidiary of **GENERAL TELEPHONE**

5

PAYSTATION CATALOG
Contains complete information on our paystations and paystation accessories. Tips on installation, maintenance and promotion of paystations. 16 pages.

6

STROWGER AUTOMATIC
Explains why "Telephone Men Choose Strowger". Discusses important buying factors to consider in purchase of central office equipment. 16 pages.

7

SUPPLY CATALOG
Lists over 2,500 items—everything that's needed for telephone construction and maintenance. Indexed for quick reference. Easy to order from. 280 pages.

8

RECORDER-ANNOUNCERS
Describes all five types of recorder-announcers, and gives complete specifications. These machines build revenue and good will at the same time! 8 pages.

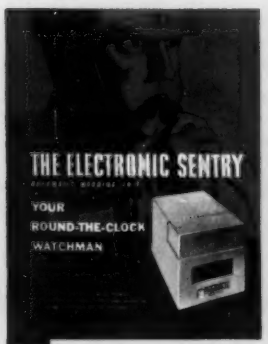
increase earnings and reduce costs!

13

SATT
Shows how a typical SATT system processes toll calls. Three case histories explain how telephone companies increase revenue with SATT. 4 pages.

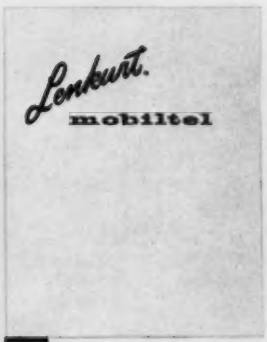
14

MICROWAVE EQUIPMENT
Contains technical summary, circuit description, and additional helpful information on Lenkurt's Type 74A microwave system. 4 pages.



15

ELECTRONIC SENTRY*
Explains how Electronic Sentry guards against fire, theft and other hazards. You can sell this warning service to commercial and rural suscribers. 4 pages.



16

MOBILE TELEPHONE
Gives facts and figures on Mobiltel Manual and Mobiltel Automatic—Lenkurt's completely new mobile telephone systems. 4 pages.

*ELECTRONIC SENTRY is a trade name of Electronic Secretary Industries, Inc.

AUTOMATIC ELECTRIC SALES CORPORATION, Northlake, Illinois.

Attention: J. M. Zidlicky

Gentlemen:

Please send me the idea literature circled below:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

MY NAME IS_____
PLEASE PRINT CLEARLY

MY COMPANY NAME_____

STREET ADDRESS_____

CITY_____ ZONE____ STATE_____

Continuing with this idea, we believe that the number of items to be sold by installers and repairmen should be limited to one or two, and we think these men will be helped, or their task made easier, if they are provided with a means to get the conversation with the customer started in the right direction. For this purpose, we ask our men to memorize this statement, "Mrs. _____, if you order another telephone in your choice of color while I am here, you will save the cost of installation. How about one in the bedroom?"

You will notice that we do not attempt to teach selling techniques. It is true that the memorized phrase does appeal to the desire most people have to buy at a saving, and it does ask for the order by requiring the customer to accept or turn down the suggested location. However, the installer or repairman is not required to understand the subjective elements in these phrases. It will also be noted that it does not employ the word "extension". This is done because even in cases where jacks are involved additional portable sets can be sold. For the present, at least, we do not intend to involve our installers in a lot of sales jargon. We believe that once the conversation is started in the right direction the man's naturalness will be one of his best sales tools—provided, of course, that he wants to sell.

Next, we require that the test desk make a record of whether or not the customer was asked to buy whenever an order associated with residence service is completed or a case of trouble cleared. This record is sent to a central point where, at the end of each week, a report covering the activities of all installers and repairmen is prepared and sent to the plant supervisors and the division heads concerned. This report groups the individuals by supervisors and it shows separately the number of orders completed, the number of repair service visits made, the number of times an order was requested, and the number of sales made by individuals.

Left to right: L. F. Roberts, USITA director of information; M. H. Alexander, USITA toll engineer; R. H. Stewart Mitchell of J. M. Mathes Advertising Agency, New York City; C. S. Snyder, USITA assistant secretary; Ted Okie, president of the J. M. Mathes agency, and Scotty Bailey, son of USITA Executive Vice President Clyde S. Bailey.

At the end of each month, the weekly reports are consolidated showing the performance, by supervisor, with respect to asking and selling. The monthly report does not show individual performance. The monthly report goes to the plant supervisors, their division heads, the plant head and the general manager.

The main purpose of the procedure outlined up to this point is to fix the responsibility in the plant supervisor for insisting that installers and repairmen do ask for orders. The monthly report enables the general manager, the plant head, and the division heads to determine which plant supervisors are getting the best performance in this respect. The weekly reports enable the plant supervisors to know the number of opportunities by individuals, the number of times each one asked for, or says he asked for, an order and the number of sales reported by each one.

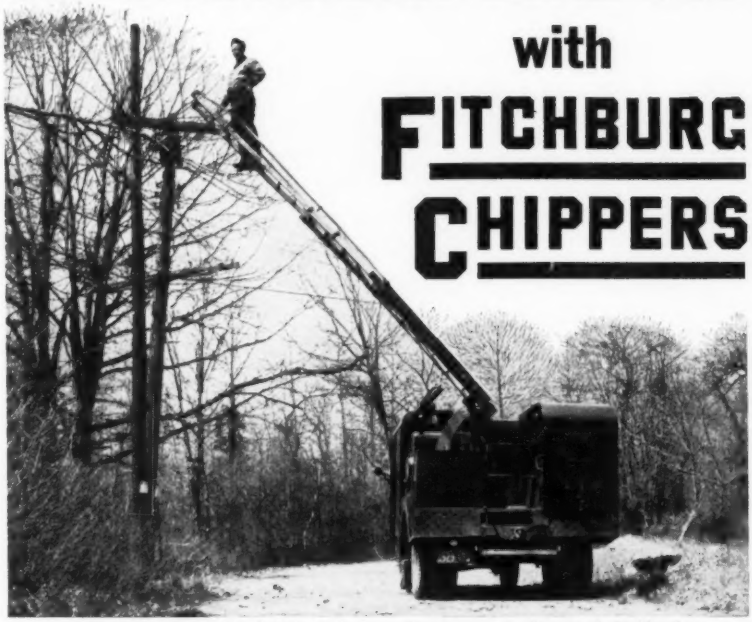
For the moment the quality of the sales effort, as would be indicated by the percent of sales to the number of requests for orders, is of secondary importance to us. We are relying on the old adage that nothing succeeds like success. We hope that the installer or repairman who religiously uses the opening statement mentioned earlier will frequently find himself talking price, location, etc., and, regardless of the quality of his sales pitch, he will get some orders. It is our idea that he will learn for himself from these conversations which ideas sell and which ones don't.

It is also our opinion that the speed of this learning process on the part of the installer and repairman, and consequently the effectiveness of his sales efforts, is completely dependent on the plant supervisor. In the beginning, the supervisor will emphasize asking for the order. When he has achieved a satisfactory performance on this score, say 85 to 90 percent of contacts, then he will begin to look for ways and means to encourage and stimulate individuals to be more effective. The weekly reports will be one of his tools to develop a spirit of competition between groups. However, the plant supervisor and his division head also need help and assistance at this stage of the game and this is where the plant head and the general manager enter the picture.

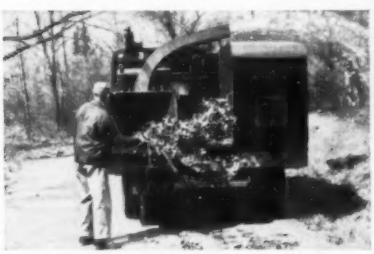
The plant supervisors and their division heads must be sold on two scores. First, they must be sold on the fact that the company needs to conduct an all-out, hard hitting, and continuous sales effort. Secondly, they must buy the idea that plant employes, who come in daily contact with customers in their work, should logically be expected to make use of those contacts

Left to right: R. B. Wiseman and Paul Henkels, both of Elkhart, Ind., and Daniel Ault of Monroe, Wis.

Telephone and Power Companies
CUT BRUSH DISPOSAL COSTS 25 TO 50%
with FITCHBURG CHIPPERS



Crewmen from Rockland Light and Power Company, now Orange & Rockland Utilities, Nyack, N. Y. use special aerial ladders for pruning topmost branches.



BRUSH DISPOSAL METHOD No. 1
Rockland Light and Power Company crewman blows chips from FITCHBURG CHIPPER along roadway.

BRUSH DISPOSAL METHOD No. 2
Rockland Light and Power Company crewman blows chips from FITCHBURG CHIPPER into truck bin.

Some of the many Telephone and Power Companies using Fitchburg Chippers

Arizona Public Service
Phoenix, Arizona
Atlantic City Electric Company
Atlantic City, New Jersey
Central Hudson Gas and Electric Co.
Newburgh, New York
Consumers Power Co.
Jackson, Michigan
McDaniel Telephone Company
Salkum, Washington
Millington Telephone Co.
Millington, Tennessee
Mt. Vernon Telephone Corp.
Mt. Vernon, Ohio
Missouri Power & Light Co.
Hermann, Missouri
New Jersey Bell Telephone Co.
Vineland, New Jersey
Ohio Central Telephone Corp.
Patuskala, Ohio
Pacific Telephone and Telegraph
Northwest Area
Portland General Electric
Portland, Oregon
Public Service Co. of Oklahoma
Lawton, Oklahoma
Shawnigan Water and Power Co.
Quebec, Canada
Somerset Telephone Co.
North Anson, Maine
Southern California Edison Co.
Los Angeles, California
Valley Telephone Company
Silverton, Oregon
West Jersey Telephone Co.
Belvidere, New Jersey

A FITCHBURG CHIPPER will help get your brush disposal job done with *fewer men at less cost*—in any weather, wet or dry. No more loading, hauling, dumping, burning. Chips may be automatically loaded on truck or blown along right-of-way to keep down weeds.

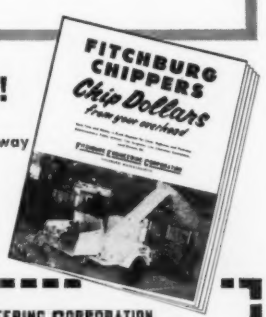
SAFETY IN OPERATION: Exclusive Fitchburg spring-activated feed plate automatically adjusts as wood of different sizes is fed into the machine. This feature allows you to chip larger size wood without extra power. It reduces shock action, protects the operator in case foreign materials are accidentally fed during operation.

MINIMUM MAINTENANCE: No heavy fly wheel to cause clutch strain or bearing failure. Easily maintained by your own field personnel.

ONE YEAR GUARANTEE: Only Fitchburg Chippers give you *all* these features, backed by the experience and engineering skill of the world's pioneer manufacturer of wood chipping equipment. For a facsimile of the exclusive Fitchburg guarantee and color brochure described at right, mail the coupon today.

NEW! FREE!

Mail Coupon for Brochure. Shows cut-away drawings of Fitchburg Chippers in action, specifications, photographs.



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Fitchburg, Mass., Dept. T-108
Send Free Copy of "Chip Dollars from Your Overhead."

Name .....
Position .....
Company .....
City or Town ..... State .....

FITCHBURG ENGINEERING CORPORATION FITCHBURG, MASS.

for the purpose of selling the items designated by the management, and thereby do their part in helping the company reach its revenue objectives.

Let's think for a minute about the company's need for a hard hitting continuous sales program. If your experience is like ours, you find yourself at this time furnishing main station service to 85 per cent of the households in your territory. In the view of many competent economists, when a market is 80 per cent developed, for all practical purposes, it is saturated. In other words, it's not practical to bring the other 20 per cent into the fold through special sales and merchandising programs.

Now, just what does this mean to us in the telephone business? In Rochester, we think it means that the growth in main station service since the war, with little or no sales effort, to the point where 85 per cent of the households have service indicates that at any given time 85 per cent of the families will, without persuasion, demand service unless some serious and prolonged reduction in their income should occur. It also means that the growth in residence main stations is a function of family formation.

If such a reduction in income occurs, the rate of main station growth must decline if our bogey is one main station per household. Since the rate of family formation has already declined markedly because of the low birth rate in the 30's and early 40's, there is no immediate prospect of resuming the rate of main station growth, based on one main station per family, that prevailed between 1945 and 1958. In fact it may be 1968, and possibly 1970, before that occurs.

This also means that, unless we can find ways and means of increasing revenues per customer, our total revenues will level out and our companies will stop growing. We all know that once any organism, plant, animal, or economic, stops growing it begins to decline and ultimately dies. It seems clear then that telephone companies have no alternative but to sell more to existing customers at least until the next crop of marriages arrives.

That brings up the question what do we sell. Well, we can sell additional lines for family use in the case of professional people, for older folks living in with relatives and for teenagers. We can upgrade present users to provide faster service and privacy, we can sell more telephones per main station to reduce work, provide greater privacy, to give a feeling of security and to pamper the desire for luxurious convenience — all this for pennies a day. We can add value to service with more listings and through conveniences like hands-free telephones, extension bells, automatic answering service and many other items yet to be perfected.

In fact, we can provide services that hold back the clock. In this day and age, time is the most precious and valuable thing in our existence. All labor-saving and time-saving services and devices lengthen our days as well as our arms and legs, and they enable us to live fuller and more satisfying lives. Certainly, the general manager and the plant head have a bill of goods that can be sold to middle plant management, and through them, to the installers and repairmen.

Neither should it be difficult to convince our installers and repairmen that it would be wasteful and silly to hire specialists to do this sales job when they are already in contact with the potential buyers under most favorable circumstances to make sales.

It seems clear to us in Rochester that poor sales results in the plant department cannot, in good conscience, be blamed on the craft people. Instead, we believe that a good sales job requires enthusiastic leadership by supervision from top to bottom. When such leadership is coupled with a good

say "Lindsay"
when you order
For friendly, prompt, complete service in telephone supplies, more and more leading companies say "Lindsay" when they order. Lindsay specializes in telephone supplies only—warehouses a complete line of the finest nationally known brands.
THE LINDSAY TELEPHONE SUPPLY CO.
360 East Highland Road, Northfield, Ohio
Telephone: IMperial 7-7181
OKOIDSA
FOR THE FINEST

follow-through procedure to insure that objectives are met, only one thing can happen and that is success in this endeavor.

United of Mo. Names White District Manager

Charles B. White has been appointed district manager at the United Telephone Co. of Missouri's Maryville district office, according to an announcement by J. G. Kreamer, vice president in charge of general operations for the company.

Mr. White assumed his new duties after 15 years of telephone experience, which begain in Garnett, Kan., with the former Central Kansas Telephone Co.

In 1947, after serving four years with the Army Signal Corps during World War II, he transferred to the Horton, Kan., exchange of the United System.

During his 10 years of service at Horton, he advanced to local manager. He then was promoted to assistant district manager at Maryville, Mo., earlier this year.

He succeeds John O. Tidd, former Maryville district manager, who recently succumbed to a heart condition.

MBT to Assist Subscribers In Marketing and Planning

Michigan Bell Telephone Co. announced on Oct. 8 it has set up a new department to assist business customers in their marketing and planning services.

A primary aim will be to show trade associations and sales organizations how to use telephone communications to best advantage, particularly in marketing activities.

Heading the new department will be Robert H. Sisson, who said:

"We're prepared to give presentations at trade association conventions, dealer meetings, and other business gatherings on how the telephone and its related services can be used in marketing activities.

"Our advisory and consulting services also will include how to attract business calls and turn telephone inquiries into sales.

"To an extent, we've always done this. But with the business resurgence that is now becoming evident, we believe we can serve our customers better by having a special group engaged in this work."

Always Tomorrow

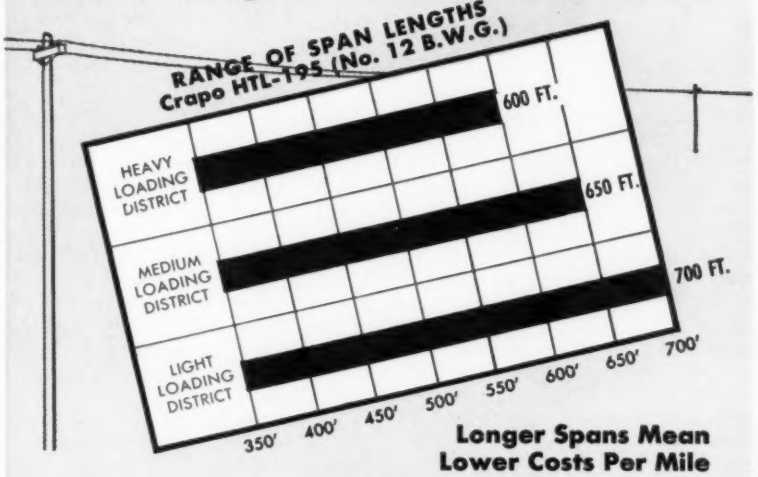
"Tis always morning somewhere in the world."—RICHARD HENGEST HORNE.

Crapo

HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The *NEW LOWER* Resistance Extra-High Tensile Line Wire

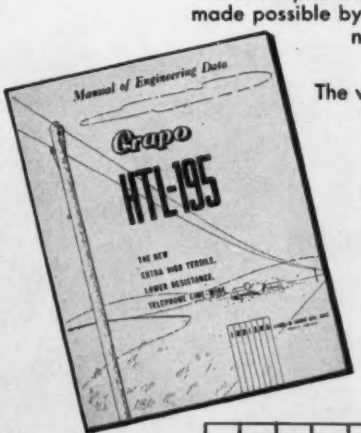


Longer Spans Mean Lower Costs Per Mile

You can cut the number of pole structures to a minimum when you use **Crapo** HTL-195 in building rural telephone lines. Extra long span construction, made possible by the high physical strength of this new wire, means marked savings in material and installation costs.

The voice transmission quality of **Crapo** HTL-195 is equal to that of **Crapo** HTL-135 and superior to older grades of ferrous wire.

Pertinent technical data have been prepared to assist engineers in designing and building extra long span lines with **Crapo** HTL-195.



WRITE TODAY for FREE COPY of the CRAPO HTL-195 "Manual of Engineering Data" No. A-195

INDIANA STEEL & WIRE COMPANY, INC.
MUNCIE, INDIANA

Production Measurement

*By GEORGE C. RICHERT**

(A Plant Conference Address)

IN THE operation of the telephone business, the plant department is responsible for the installation and maintenance of all telephone equipment used in furnishing service to our customers. This is a very far reaching responsibility. Although in our day-to-day operations there is a definite repetition of effort in connection with the items associated with plant work, it may be somewhat surprising to many of us if called upon to list in their order of importance the items which warrant constant attention by management people in the over-all conduct of the business.

In preparing such a list it is quite logical that it would be compiled with due consideration of the various craft functions such as installation, construction and maintenance, and careful consideration of the major items comprising the respective functions.

It is also logical when considering plant responsibilities that our attention would be directed to the elapsed time for connecting service and the quality of service we furnish. We would most likely give careful thought to the speed of connecting the service, because it affords an opportunity to gain the customer's good will by giving him what he wants when he wants it, as well as an opportunity to obtain the benefit of the additional revenue in the shortest possible time after receiving his request for service.

The installation of service comprises the placing and connecting of all station apparatus, equipment and wiring on the customer's premises, providing and connecting outside plant cable and wire facilities between the customer's premises and the serving central office and providing and connecting the central office equipment required.

It is apparent that in order to meet customer demand, considerable advance planning is involved to assure available adequate amounts of materials and supplies, outside plant and central office facilities, and sufficient trained personnel to meet varying day-to-day demands in furnishing a satisfactory grade of service at a reasonable cost.

When dealing with advance planning, it is necessary for the plant department on many occasions to obtain the advice and cooperation of other departments in order to meet its responsibilities. This applies particularly to additions to or rearrangements of central office equipment and outside plant facilities, etc. For example, the engineering department plays a major part in determining the amount of outside plant to be provided or rearranged and the details and layout of work to be done by the plant department.

We have considered but a relatively small number of the major items comprising one of the respective functions, "Installation Service." It would appear that after preparing our list of items in the order of importance the final summation will focus attention on two very controlling items: Service and costs.

O. M. Westrup (left) of Mattoon, Ill., and A. O. Lindle of Grinnell, Ia.

There is no doubt that we are all thoroughly familiar with the many details, tools, methods and problems associated with plant department operations. Over the years, we have installed and disconnected millions of miles of cable and wire; and investigated and cleared millions of troubles and complaints brought to our attention by our customers. We have also devoted an appreciable amount of time and effort to improving our techniques and skills and to the training of our people. We have introduced improved instrumentalities with a view of improving service and production and reducing costs.

I would now like to suggest for your consideration some methods whereby we might determine through a plan of measurement more about our service results, what our production results actually are, and what the plant department costs by functions actually are. In other words, a service measurement plan, a productive man-hour measurement plan, a cost measurement plan; to determine what we are buying for the money we are spending.

Why are Measurements Necessary? Measurements are necessary in any business, small or large, to show what is happening, or what the trend is toward accomplishing desired results. In any successful business, it is necessary for management to know what, if any progress is being made, what is going on as indicated by:

Volume of sales in units.
Volume of sales in dollars.
Unit production per employe or department.
Per cent of defective units or items.
Number of complaints.
Number of troubles found.
Cost of clearing trouble.
Number of poles placed.
Cost per pole placed.

Measurement devices in one form or another are used universally not only in business but in practically all lines of endeavor. In school, students are graded; in baseball, batting averages are kept; in personal finances, budget and bank books are balanced, etc.

In our business, measurements provide basic data relating to service, costs and many other factors affecting operations. Analyses of these data are necessary if we are to determine what must be done to improve unsatisfactory results or trends.

Such measurements can provide management with a simple means of gauging comparative performance and the trend of each measured operation from month to month or over longer periods. They, therefore, can be an administrative aid to management in achieving

*Mr. Richert is Engineer of the United States Independent Telephone Association.

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well balanced and high quality performance.

Measurements indicate where effort should be applied to render satisfactory service within the performance ability of our forces and equipment. They provide an opportunity to put our finger on a trouble spot and determine when and where to apply corrective action to restore performance to the desired level. Measurements also provide a stimulus for improving results by providing a ready means for making comparisons with past performance in our own company and with the results of similar activities in comparable operating companies, units or forces.

We have the knowledge and ability to judge the quality of workmanship and the amount of effort that is being expended in doing the everyday plant job. For years, we have devoted attention principally to getting things done such as planning for plant additions and conversions, rearrangement of plant, installing new service, restoration of service, upkeep maintenance and the many other details involved in our plant operations. We have acquired, through observation and experience, a working knowledge of the time factors involved in completing certain operations associated with our work, but in many instances we have not provided ourselves with a reliable yardstick or measure, based on records of actual performance, that can be used as a guide in making comparisons of manpower efficiency and related costs of our plant performance.

We are now confronted with the need to determine how we can measure our effectiveness to assure ourselves, and other management people, that expenditures of our manhours and dollars are being properly controlled as evidenced by facts contained in performance reports made available on a monthly or quarterly basis, or at other intervals.

It is true that some of us have made some cost comparisons. The generally accepted procedure followed today is to report costs along organization lines to the persons who are responsible for their incurrence—to those who are in a position to take action calculated to control costs since costs are incurred under their supervision. This type of report usually contains information relating to total expenditures for each responsibility area by organizational divisions or functions for a certain period. The expenditures reported are all of those associated with the respective functions, such as installation, maintenance, construction, etc.

The total actual cost incurred during the period under study is usually compared with the budget and the variances indicated. In those cases where no budget is prepared, comparison is made with costs experienced during some previous period or on some other basis. In a number of companies the total cost per telephone in service is used as a basis for comparison.

Left to right: D. O. Hood of Medford, Ore.; Allan R. Stacey of Sunland, Cal.; B. VanFleet of Ottawa Lake, Mich., and C. D. McLellan of Lansing, Mich.

We are becoming increasingly aware that this factor, when utilized as a measure of effective administration or plant department efficiency is subject to the following imperfections:

(1) It does not provide the means for measuring costs associated with specific categories such as labor, materials, engineering, etc., all of which contribute to total expenditures, and should be known in order to make intelligent performance analyses.

(2) It does not contribute effectively to the detection of excessive expenditures for individual items included in the total cost.

(3) It does not necessarily indicate that costs experienced in areas with large concentrations of telephone plant as well as telephone development in sparsely settled areas are out of line when compared with those incurred in other areas with high telephone density regardless of growth.

A. N. Clark (left) of San Carlos, Cal., and A. C. Brown of Rhinelander, Wis.

(4) It does not draw attention to specific underlying factors contributions to increasing costs of labor and materials, etc., due to inflation which are not readily detected when comparisons are made on a year-to-year basis or during other time intervals.

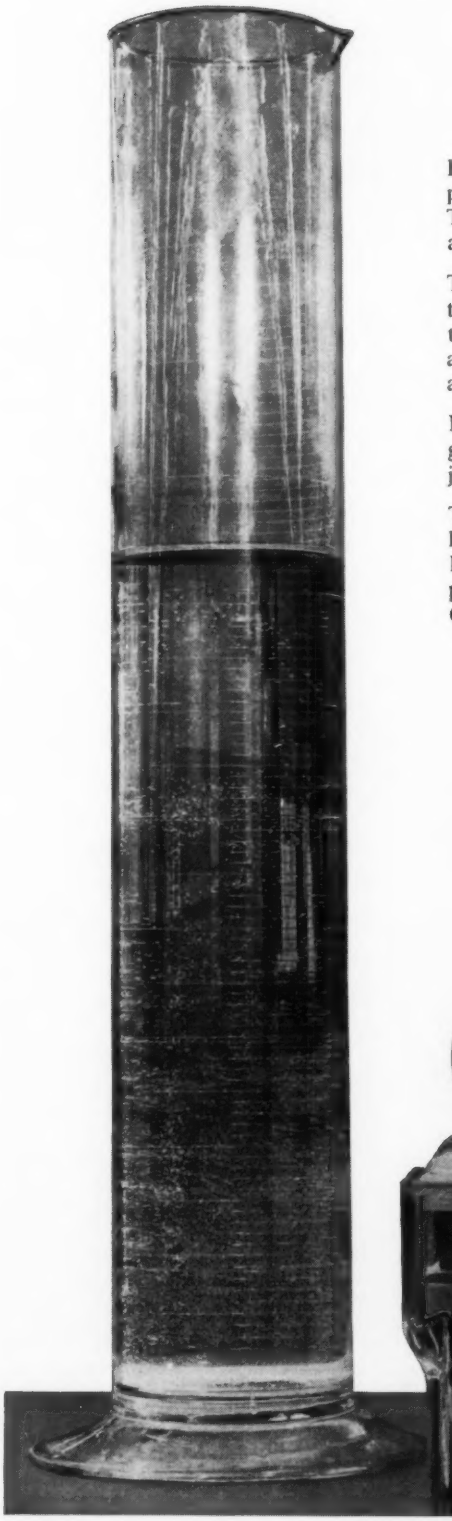
When comparisons of actual costs are made, we are confronted with the necessity of explaining variations from the budget, variation in the cost per telephone in service month by month, or variations in costs on the basis of any other standards used for purposes of comparison. There is no doubt that such data indicating these variations are helpful insofar as the information thus provided with regard to estimated and actual costs is concerned. However, they do not necessarily draw attention to actual or potential weak spots. Nor do they indicate what can be done to improve performance, the principal purpose they are intended to serve.

In order to effectively control job performance and associated costs, data on costs incurred, and work performed, based on actual studies of the respective details associated with plant department responsibility functions must be maintained.

For example, a typical function, outside plant construction, has a number of basic work operations charged to it. These include: *Pole line construction*—placing poles, crossarms, anchors and guys; *aerial wire construction*—placing aerial wire, filter coils, etc.; *aerial cable construction*—placing aerial cable, house and block cable, suspension strand, terminals, binding posts and fuse chambers, connecting blocks, loading coils; *underground cable installation; underground wire installation;* and *buried cable installation*, etc.

All of these functions involve major expenditures which can be measured by plant units and classified as separate items to isolate and control costs. However, the segregation of such data on the basis of various functions and units does not provide essential information

New Exide-Manchex Battery Gives You This Much Extra Electrolyte



Exide engineers were thinking of you and your maintenance problem when they designed this new Exide-Manchex Battery. That's why they gave you this extra-big reservoir of electrolyte above and surrounding the plates.

This is more than you get in other plante-type batteries. It means that with the Exide-Manchex Battery, watering is less frequent—therefore maintenance is easier. And it also means that you have an extra margin of safety against battery damage in case you should accidentally miss a cell.

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These advantages add up to greater power, longer battery life, and higher dependability. Clearly, more than ever, the new Exide-Manchex is your biggest battery value. Write for details and prices. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

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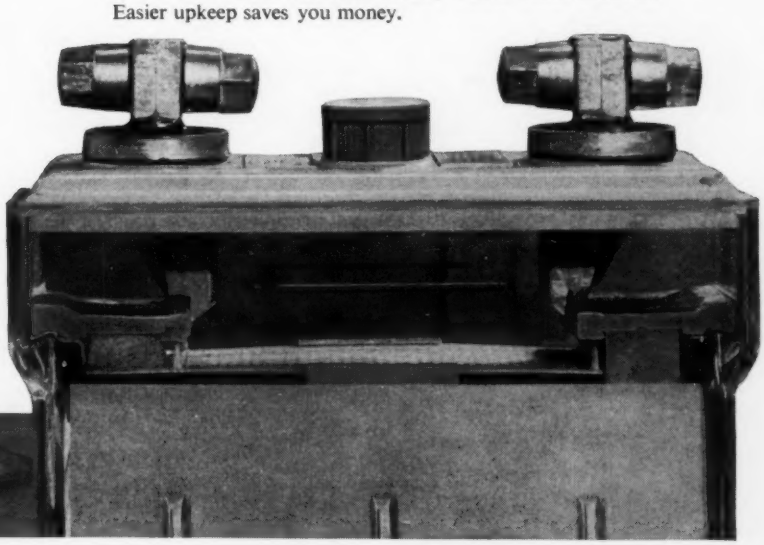
Unique positive plate. Lead buttons locked into a corrosion-resistant grid have a total effective plate area five times plate size. More power. Longer life.

Less frequent watering. Typical water loss and refill curves for the new Exide-Manchex Battery versus other batteries. Easier upkeep saves you money.



relating to the actual amount of work performed—how many poles were placed; how many miles of aerial wire were placed; how many feet of underground and aerial cable were placed, etc.

It might be well, therefore, to consider the desirability of developing plant units associated with various plant functions to be used in measuring the amount of work done and the efficiency and cost of plant operations. When doing so, it is essential at the outset to determine what a plant unit is and what it represents. It may be assumed that a plant unit is an appropriate plant item that can be used as a base to express in manhours the average time required to perform a specific plant function such as the construction or installation of a particular plant item and associated cost. On this basis it appears that, insofar as the outside plant construction function is concerned, the following categories of plant units might be considered appropriate:

Account	*Plant Unit Item*
Pole lines	Pole
Aerial cable	Sheath foot of cable
Underground cable	Sheath foot of cable
Buried cable	Sheath foot of cable
Aerial wire	Conductor mile of wire

Plant units and work operations taken into account for this purpose should be sufficiently detailed to provide a fair degree of equation for the different kinds of work done. In the pole line account, for example, different factors would be provided for different sizes of poles, crossarms, anchors, and guys. However, it must be recognized that the development of such factors involves loading some units with incidental work such as clearing of right-of-way which cannot be readily identified for purposes of accounting for specific work operations.

It is also necessary to give consideration to the matter of productive manhours to determine what they include or what is included in the time charged to the performance of each operation. Productive manhours should include on-the-job training time and all travel time. Absence due to sickness, injury, or bad weather, and excused absence due to time taken for conferences, holidays and vacations should not be treated as productive manhours. Overtime hours should be counted on the basis of hours worked.

We are now confronted with the problem of measuring the productive manhours per plant unit and cost per plant unit.

Productive manhours per plant unit are the average hours used in constructing or removing the plant unit designated, including the hours spent for incidental work. The hours per plant unit should be averaged over all sizes and kinds of plant units included in the measured account. In the pole line account, for example, the average should include all sizes of poles, crossarms, anchors and guys.

Left to right: J. Weiler of Las Vegas, Nev.; William Hatton of Washington, D. C.; Willard Wade of Victorville, Cal., and Jay Houghtaling of Minneapolis, Minn.

Cost per plant unit is the average cost related to placing or removing the plant unit designated, including the cost of all work incidental to the placing or removing operation. For example, in the pole line account, the placing cost should include charges made for clearing of right-of-way and placing of crossarms, anchors, etc. These costs should be averaged over all sizes and kinds of poles placed during the study period. Construction costs and removal costs should be indicated by sources and in total. Such data are useful for determining relative cost levels and trends. The breakdown of total unit costs into sources will direct attention to any components costs that may be contributing unduly to total costs.

It is understood, of course, that these measurements are applicable also to cable placing and cable splicing and the various accounts associated with other plant functions such as installation and maintenance.

You have probably given some thought to the problems involved in developing measurement plans. It also should be understood that when doing so you are embarking upon a fact-finding mission. Your approach should be carefully planned and you should proceed with caution. Because of the large number of operations involved in the various functional responsibilities associated with plant activities, progress in the establishment of measurement plans may appear to be slow. Also, before putting a measurement plan into effect, you would be well advised to make certain that a carefully laid foundation is provided, that the design lends itself to easy expansion, and that expansion is limited to the ability of those persons responsible for administering the plan to thoroughly understand each measurement and its application and the desirability of using it effectively and judiciously.

When instituting such a plan, it is suggested that initially a plan for measuring pole line construction be undertaken.

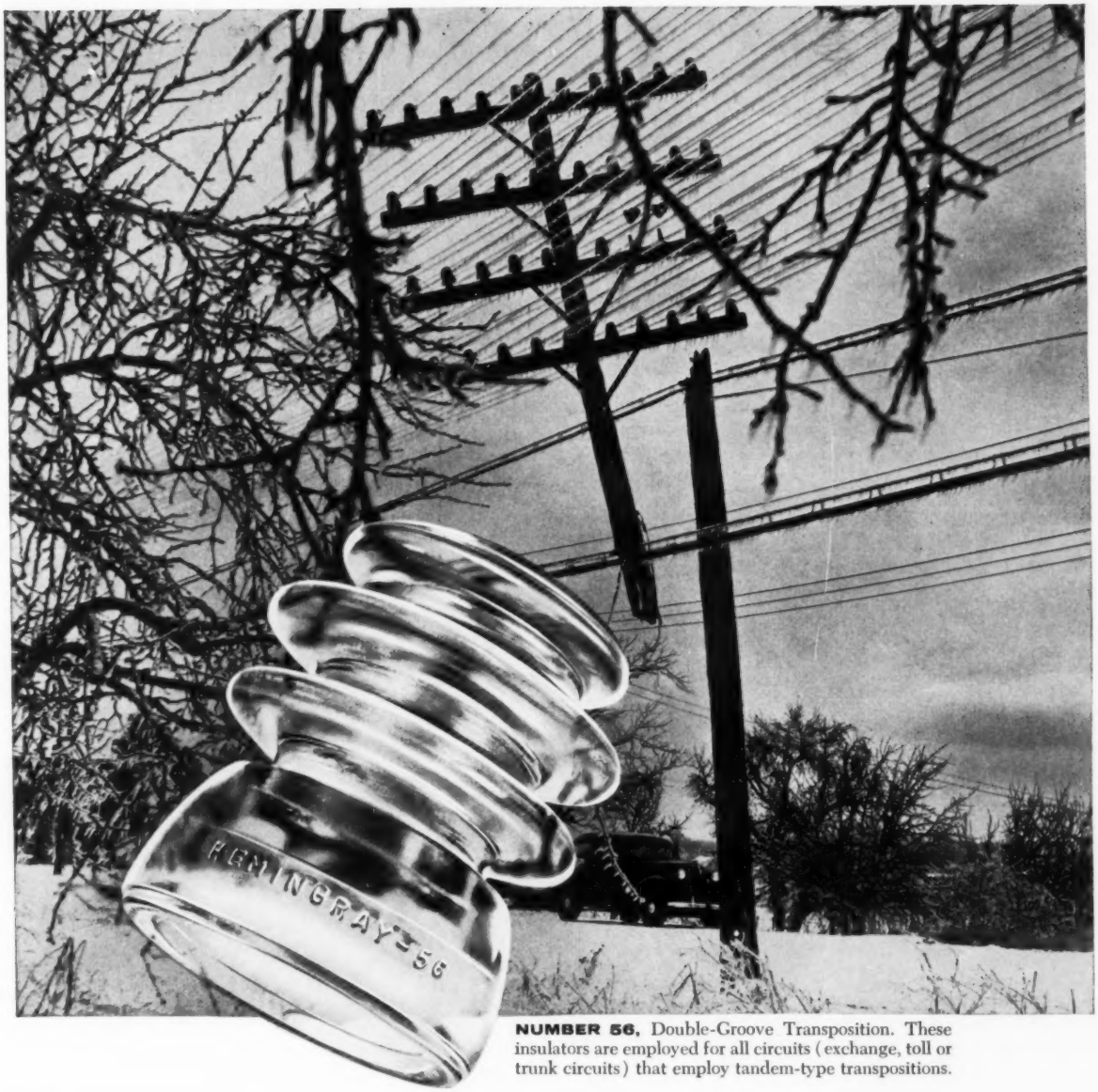
Construction costs should be expressed in gross amounts. Units of plant placed and removed for each of the accounts measured should be subdivided on the basis of the following categories with which costs incurred can readily be identified:

Direct labor—including local plant administration.
Payroll expense.
Engineering expense.
Motor vehicle expense.
Material and supplies.
Material overhead.
Contractor's charges.
Employe expense.
Other expense.

Contract labor may be employed, depending upon local conditions, to perform work which under other circumstances might be performed by telephone company forces. Therefore, provision should be made for including costs, hours, and plant units applicable to contract work.

Your (USITA) Plant Committee is well aware of the expansion that has taken place in the Independent telephone industry in recent years, and of the increasing expenditures being made in connection with the operation of the business. It is of the opinion that a prompt and thorough examination of procedures and methods is essential in the interest of meeting the objective of furnishing satisfactory telephone service at a reasonable price, which the public is willing to pay, with due consideration to the welfare and progress of the industry, those who have invested their savings in it, and its employes.

To attain this objective, the committee recommends the development of a measurement plan along the lines outlined as a very important help to management.



NUMBER 56, Double-Groove Transposition. These insulators are employed for all circuits (exchange, toll or trunk circuits) that employ tandem-type transpositions.

Dependable ...in emergencies

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Traffic Consideration of Mark Sense Toll Tickets

By R. E. COFFMAN

(A Traffic Conference Address)

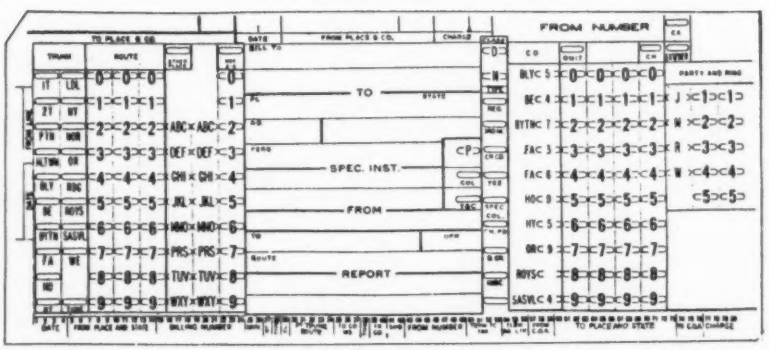
THE TERM "mark sense" is relatively new to traffic operations in the industry and you, like myself, may have questions as to how this process traveled from the accounting department to traffic and the effect it will have on our toll boards.

"Mark sense" is not defined in Webster's Dictionary, however, accounting informs us that this process involves the placing of a sensitized line on a punch card in such a manner as to stimulate the IBM equipment. A sample of an operator mark sense ticket or punch card was found on your chair as you were seated. (See accompanying illustration). Referring to this sample, you will note that there are small "louvers" or "bubbles" provided under, or as a part, of each item to the left and right of what appears to be a regular toll ticket. It is in these "louvers" that the sensitized mark is entered to stimulate the IBM equipment. As a matter of interest, the mark need not be exactly in the block provided; the IBM machine will recognize the entry if it is slightly above or below the box or if it extends beyond the ends of same.

It will be noted that the mark sense ticket has horizontal boxes for the sensitized mark, however, experience reported by the Bell System indicates the traffic preference is a diagonal box such as you will see later in some slides setting forth their Woonsocket, R. I. trial run. Since accounting has no preference, the traffic recommendation can be accepted.

Mark sensing of toll tickets has been under consideration for several years. Several trial runs were made in 1952 by the Bell System and in 1954 they were discontinued, since the results were not fully satisfactory. With the installation of more CAMA and AMA equipment, a greater portion of the toll tickets was reduced to punch cards. Since the Bell System objective was to adopt full electronic handling of accounting procedures, it became necessary for them to again consider a mark sense ticket for operator handled calls. In 1957 several Bell System companies ran tests directed at reducing operator work time to a point where no time in excess of normal ticket preparation would be required. These trials proved to be successful and the entire Bell System is now expected to be on a mark sense basis by 1960 with their metropolitan areas completed by 1959.

Based on the recent successful industry trials several larger Independent

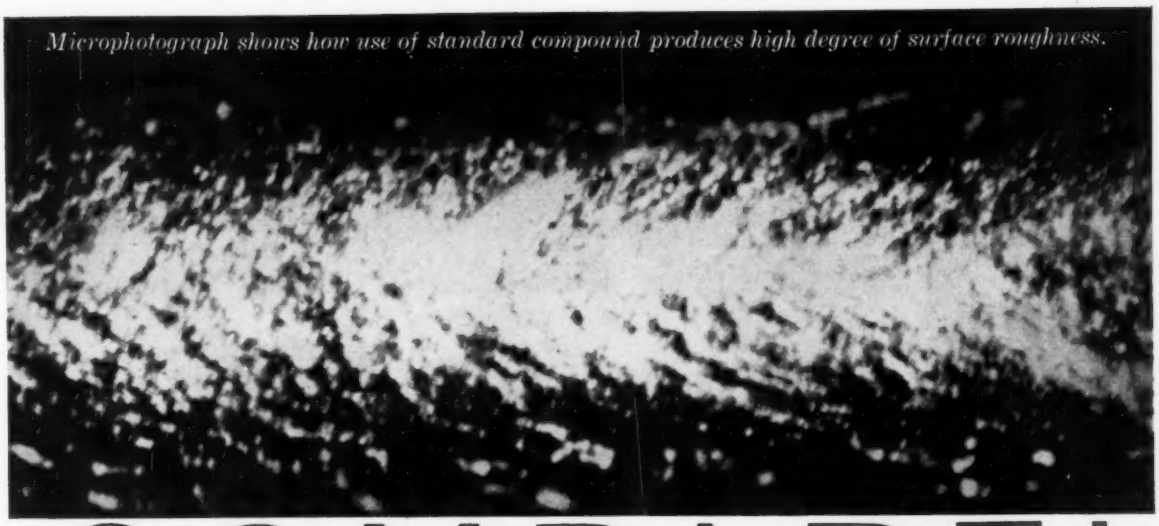


OPERATOR MARK SENSE TICKET

Columns	*Field Description*
1- 4	— Date
5-14	— From Place and State
15-24	— Billing Number
25-26	— Minutes
27	— Settlement
28	— Type
29	— Class
30-31	— Point or Trunk
32-34	— Route
35-37	— To Central Office—Mark Sense Code
38	— Tributary
39-40	— From Central Office Code
41-42	— Switchboard Number Code
43-49	— From Number
50-53	— Terminating Toll Center or Local Tax for Intrastate Messages Only
54-56	— Terminating Revenue Accounting Center
57-59	— From Central Office—Alphabetic
60-77	— To Place and State
74-76	— To Central Office—Alphabetic
77-80	— Charge

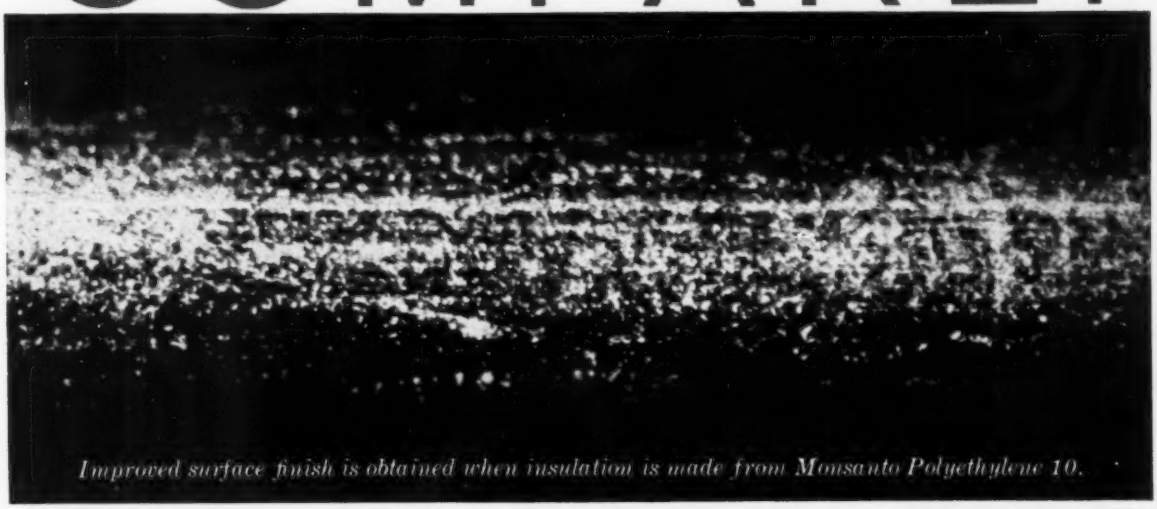
The report of the USITA Traffic Committee Chairman H. J. Kleinhammer will be published in a later issue.

*Mr. Coffman is General Traffic Manager of General Telephone Co. of Michigan, Muskegon, Mich.



Microphotograph shows how use of standard compound produces high degree of surface roughness.

COMPARE!



Improved surface finish is obtained when insulation is made from Monsanto Polyethylene 10.

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Monsanto's new natural polyethylene insulating compound, Monsanto Polyethylene 10*, promises improved surface finish in extruded primary insulation.

New Monsanto Polyethylene Insulating Compound (MPE 10) offers telephone cable manufacturers superior extrudability at high rates, along with the smooth surface finish that can reduce frequency of sparker failure during twisting and cabling operations. MPE 10—thoroughly tested in commercial applications—meets standard telephone cable requirements. Write for complete data to Monsanto Chemical Company, Plastics Division, Room 455, Springfield 2, Massachusetts.

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companies have now initiated mark sense processes or plan on doing so in the near future.

It appears that the mark sense program will gain momentum in the near future very likely involving all companies in one way or another. Adoption of mark sense toll tickets brings several changes in the traffic operation.

Operator's mechanical pencils and/or ball point pens will need to be replaced with special pencils containing sensitized lead. These pencils will be complete with erasers since erasure in the mark sense boxes is required if a mark is made in error. Lining through the incorrect entry, as we now do on toll tickets, will not suffice since the IBM equipment could not recognize which was the correct entry and would reject the card necessitating manual handling and reducing the efficiency of the mark sense accounting process.

The sensitized pencil is used to make entries in the regular toll ticket section of the mark sense card and here, as is currently the practice, the operator will line through any incorrect entry. It is tentatively planned to provide a slip-on type dial tool for use over the eraser on the mark sense pencil. With key-pulsing the requirement for dial tool pencils should, however, be reduced if not eliminated entirely.

Information is entered on the mark sense card by the toll operator in any order that will speed the call to completion. It is not necessary that the written record be completed before the mark sense entries are made or vice-versa. In fact, there is some question whether any entry is required in the written portion of the normal "sent paid" ticket except the last four digits of the called number. To follow such a practice necessitates the toll operator entering the mark sense data in lieu of the written data thus reducing somewhat the ticket preparation time and thereby reducing costs. On calls billed to third station the calling number would not be mark sensed—instead, the "bill to" number would be written in the "Spec. Inst." space.

When the written data section of the card is used, the "To" information is entered first followed by the "From" data. These entries are reversed compared to the order of appearance on our current standard toll ticket; the reasoning behind this change was that customers generally place a call by saying "Calling Chicago" or the like followed by their number. The order of information on the mark sense ticket conforms to the customer's habits and expedites the advancing of the call.

It is not expected that this new procedure will require any increase in initial training time for new operators. Operators currently on the force may require from a day and one-half to two full days to be instructed in mark-sensing techniques following which they would develop them in actual operating.

Left to right: H. K. Culbertson of Sterling, Kan.; Mr. and Mrs. Rolley L. King of Caldwell, Kan.; and Mrs. Paul Grauer of Wilson, Kan.

Conversion to mark-sensing can be accomplished on either a flash or progressive basis; in small offices where training would not cover a great amount of time, the "flash" cut appears best, however, larger metropolitan offices should be cut on a progressive basis.

Experience has indicated that review with the operator of her mark sense tickets rejected by the accounting machine helps her to attain proficiency.

During conversion and shortly thereafter, it may be desirable to station a traffic employe in the accounting department to correct tickets rejected by the machine such as light marks, etc. Where the rejected ticket resulted from omission of data, this traffic representative can log the errors by operator number and office for referral to the chief operator for training purposes. This traffic employe can also use this time to train the accounting people in rating tickets.

Left to right: F. H. Schafer and H. N. Bovee, both of Clintonville, Wis., and E. B. Samp of LaCrosse, Wis.

Traffic practices will change slightly when mark-sensing processes are adopted, i.e.:

(1) Tickets will not need to be sorted for accounting since the IBM machines can perform this operation. Accounting can also furnish a count of calls and messages thereby removing this Traffic clerical work.

(2) Since tickets are not sorted it will be impossible to furnish time and charges (T&C) unless requested when the call is filed. Should an operator receive a request for time and charges after a call is completed, she will advise that the ticket has been forwarded to accounting and offer to obtain the information pointing out that approximately three days will be required to do same. If the customer still insists on the information as of that moment, the operator will offer to furnish an estimate of his charges if he can estimate the conversation time and furnish the called point.

(3) Ticket rating will no longer need to be performed in traffic; no major wage savings will result from this change insofar as most Independent companies are concerned since rating is generally performed as an overlap or by night operators rather than by Rate Operators. The unoccupied time of the night operators can be used to mark elapsed minutes on the tickets where conversation exceeded three minutes and five seconds; if conversation is less than this the IBM machine can be arranged to automatically rate the call. Consideration should also be given to the night operator placing new strips on rotary files to reduce confusion around these files during the normal day.

Where considerable unoccupied time remains, it may be advisable to close the office and transfer the services to another nearby exchange.

As might be expected, application of

(Please turn to page 158)

"28 toll calls on this bill—
yet I made it out in seconds the Recordak way"

Just 4 items per bill! That's all the entries you make the Recordak Way—whether you bill 200 calls or 2! You just add up all toll charges . . . enter this total and tax on bill . . . then microfilm bill and toll tickets . . . clip all together and send on to customer.

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Gentlemen: Please send me more information on the Recordak Toll Billing System. CC-10

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Position_____

Company_____

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City_____ State_____

Effect of DDD on Traffic Operation

By *A. C. ZELLER**

(A Traffic Conference Address)

AS I HAVE been a full-fledged Independent for just about four years, to be asked to address you on my first appearance at your national convention, gives me a great deal of pleasure.

In the preparation of a presentation of this kind, you are given a great deal of advice, particularly as regards the quoting of figures.

Now, what, I ask you affects our daily lives more than figures? What would the Miss America Contest be without figures? What good would that piece of paper you receive each week, twice or once a month be to you without its figures? How would you keep your own figure if it were not for the figures that tell you how many calories you may use? Yes, figures can be interesting, dull, intriguing or downright exasperating.

In the preparation of a lithograph or poster, the artist prepares a separate "stone" for each color to be used, red, green, yellow, etc., and always one for the black. As the various colors are printed on the paper, they appear only as blobs of color, without life, substance or meaning. However, when the black is printed the whole picture comes to life and the poster takes on the meaning and tells the message intended by the artist.

So it is with this presentation, the words are the greens, yellows, reds, etc., and the figures are the black, making clear, I hope, the message I am trying to convey to you.

DDD and Traffic Operations

The effect of Direct Distance Dialing (DDD) on traffic operations depends upon many factors. Some of the principal ones are, the distribution of traffic between short and long-haul and station-to-station and person-to-person, the volume of collect, coin box, enterprise, PBX and PABX traffic, the availability of the trunk layout, and many others. As these factors vary for each office and area, their effect can only be determined by a detailed study.

I am not going to attempt to tell you of the effect DDD may have on traffic operations in your office or area. However, I will endeavor to show you the effect the installation of a DDD system in Warren, O., had, not only on traffic operations, but other operations, as well. This may help you to visualize to some extent, the effect a DDD system may have on your operations.

Before discussing the effects of the DDD system on the various operations in Warren, I would like to take a few minutes to show you where Warren is located and the area served by Warren Telephone Co.

The city of Warren is located in the northeast section of Ohio. It is a highly industrialized city, located in the heart of the great Mahoning Valley steel district.

Midway between Cleveland and Pittsburgh, Warren is serviced by the Erie, Pennsylvania and Baltimore & Ohio railroads and all major transport carriers.

Excellent air service is provided by two major air lines, Capital and United, as well as Lake Central Airlines. Warren is linked with other important cities in the nation by two transcontinental highways and the Ohio Turnpike.

In addition to being a leading steel producing and steel fabricating city, it is a large producer of electrical appliances and apparatus and other products.

According to the latest estimates the population of Warren proper is in excess of 60,000.

Warren Telephone Co.

Warren Telephone company serves two exchange areas, one the Warren exchange and the other the Newton Falls exchange.

As of July 31, 1958, there were 38,000 stations in service, 35,500 in the Warren exchange and 2,500 in the Newton Falls exchange.

Since 1938, when Warren Telephone Co. was organized under the leadership of Col. Gustav Hirsch, the growth of the company has necessitated a complete replacement of all central office buildings and outside plant, the local equipment converted from manual to automatic switching equipment, the installation of a new 40 position toll board and the installation of a Strowger automatic toll ticketing system (SATT).

There has also been a steady increase in stations as is evidenced by the growth from 11,120 stations as of Dec. 31, 1938 to a total of 38,000 stations as of July 31, 1958. This is an annual increase of approximately 1,350 stations per year for the almost 20-year period.

At present Warren Telephone Co. subscribers are served through 11 central office units. Five of these units are located in the headquarters building, the other six units are located throughout the two exchange areas. Two additional units are being installed, each of these units will be housed in one of the existing buildings with one of the present units.

It may be of interest to know that Warren is the largest Independent toll center and is one of the eight largest exchange areas in Ohio.

*Mr. Zeller is Chief Toll Equipment Engineer of Gustav Hirsch Organization of Columbus, O.

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100 Hayward Road
West Acton, Massachusetts

In early 1955, the Warren company commissioned Gustav Hirsch Organization, Inc., Columbus, O., to study its toll traffic situation and to recommend whether or not additional toll positions should be installed and the traffic continued to be operator handled, or if a DDD system should be installed to care for future needs. It was my privilege to be assigned to make this study.

The study period was for the years 1956, 1957 and 1958 and, though detailed figures were prepared for each year, I am going to quote those only for the year 1958.

The study indicated that to continue manual handling of the traffic, eight additional positions would be required, increasing the toll board from 40 positions to 48 positions. These additional positions would necessitate an increase of not less than 18 people to the operating and supervisory force.

The study also indicated that, even with the limited DDD possibilities available at that time, approximately 47 per cent of the Warren originating traffic would be susceptible to customer dialing.

With 47 per cent of the traffic being completed through the DDD system, the position requirements for manually handled traffic decreased from 48 to 38 positions, a decrease of 10 positions or 21 per cent.

These 10 less positions meant a reduction of from 20 to 23 people in the operating and supervisory force.

Some of you may be wondering why there is a reduction of only 21 per cent in position requirements, when 47 per cent of the calls will be customer dialed. This is due to the short work time required to complete a call susceptible to customer dialing as compared with a person-to-person, coin box or collect call.

These differences in work time can be best illustrated by a comparison of two Bell offices in northeastern Ohio.

Office A. Approximately 90 per cent of the traffic in this office was short-haul and mainly station-to-station. As a result, the operators were able to handle from 25 to 30 calls each during the busy hour.

Office B. The traffic in this office was practically all long-haul with a high per cent of person-to-person. This was due to an Independent company office handling all short-haul traffic. As a result the operators in this office were able to handle only from nine to 11 calls each during the busy hour.

These may be extremes, but they illustrate that the difference in the call handling ability between the operators of these two offices is due entirely to the average work time per call. This average work time being so much less for Office "A" than for Office "B".

As the introduction of Direct Distance Dialing removes the short work time calls, leaving the longer work time calls to be manually handled, the over-all work time per call changes from that of Office "A" to one similar to Office "B".

If the handling of person-to-person calls through the DDD system, as mentioned in the September *Readers Digest*, is successful, the percentage of calls converted to subscriber dialing and the percentage of positions saved will come closer together.

Upon completion of the study, and after careful consideration of all factors involved, Gustav Hirsch Organization recommended to Warren Telephone Co. that a DDD system rather than the installation of additional toll board positions would best meet present and future needs.

In accordance with this recommendation, the Warren company authorized Gustav Hirsch Organization to prepare the necessary specifications for a DDD system, as well as all arrangements for installation, training and cut-over.

	8/17/58 Sun.	8/18/58 Mon.	8/19/58 Tues.	8/20/58 Wed.	8/21/58 Thur.	8/22/58 Fri.	8/23/58 Sat.
Total Outward Completed Toll Manual and SATT	3587	9229	9035				
Manual Toll Offered	1931	4751	4733				
Manual Toll Completed	1427	3951	3932				
Manual % Completed	73.9	83.2	83.1				
SATT Attempts	3561	7675	7343				
SATT Completed	2160	5278	5103				
SATT % Completed	60.7	68.8	69.5				
% SATT Completed of Total Completed	60.2	57.2	56.5				

Table 1. Warren toll traffic data.

	8/17/58 Sun.	8/18/58 Mon.	8/19/58 Tues.	8/20/58 Wed.	8/21/58 Thur.	8/22/58 Fri.	8/23/58 Sat.
Total Outward Completed Toll Manual and SATT	3587	9229	9035	8956	9065	9204	5593
Manual Toll Offered	1931	4751	4733	4864	4925	4944	2901
Manual Toll Completed	1427	3951	3932	4052	4070	4041	2220
Manual % Completed	73.9	83.2	83.1	83.3	82.6	81.7	76.5
SATT Attempts	3561	7675	7343	7152	7431	7441	5303
SATT Completed	2160	5278	5103	4904	4995	5163	3373
SATT % Completed	60.7	68.8	69.5	68.6	67.2	69.4	63.6
% SATT Completed of Total Completed	60.2	57.2	56.5	54.8	55.1	56.1	60.3

Table 2. Warren toll traffic data.

Toll Board Offered (Warren Originating)	4,821
Toll Board Messages (Warren Originating)	4,006
SATT Messages (Warren Originating)	5,060
Total Messages (Warren Originating)	9,066
Toll Board Per Cent Completed	83.1
Per Cent SATT Messages of Total Warren Originating Messages	55.8
Ticketer Attempts	8,452
Ticketer Attempts per SATT Message	1.67
Operator Attempts	7,379
Operator Attempts per SATT Message	1.46

Table 3. Warren subscriber automatic toll ticketing average business day traffic data—August 1958.

• Southwire Galvanized Steel Strand

STRAND SIZE	5/8"	1/2"	7/16"	3/8"	5/16"	9/32"	1/4"	3/16"
WEIGHT PER 1000'	813 lb.	517 lb.	399 lb.	273 lb.	205 lb.	164 lb.	121 lb.	72.9 lb.
MINIMUM BREAKING STRENGTH IN POUNDS								
ASTM A-122-54T								
Galvanized (Single Galv.) Common	11600	7400	5700	4250	3200		1900	1150
Class A (Double Galv.) Common	11600	7400	5700	4250	3200		1900	1150
Class A (Double Galv.) Siemens-Martin	19100	12100	9350	6950	5350	4250	3150	1900
Class A (Double Galv.) High Strength	29600	18800	14500	10800	8000	6400	4750	2850
Class A (Double Galv.) Extra High-Strength		26900	20800	15400	11200	8950	6650	3990
Class A Utilities Grade, A.T.&T. and Western Union Spec.—7-wires		25000	18000	11500	6000*	4600		2400**
ASTM A-363-55T (No welds)								
Weldless High-Strength		18800	14500	10800	8000			
Weldless Extra High Strength		26900	20800	15400	11200			

*weight per 1000'—225 lbs. **weight per 1000'—80.3 lbs.

The infinite patience and skill used by the seafarer in stranding or splicing rope is matched by modern machines at Southwire.

Southwire Galvanized Steel Strand is manufactured to meet or exceed applicable ASTM specifications . . . and preformed to eliminate flared ends when sheared. Quality is our first concern, including premium-quality non-returnable reels on all reel shipments. Available in 250', *500' and 1,000' coils, 2,500', *5,000', 5,280' reels. Feel free to inquire about special packaging to suit your particular requirements.

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*Stock items

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- Neoprene, Polyethylene, and VWP (Vinyl) Weatherproof Copper, Aluminum and Triplex
- U.R.C. (DBWP, TBWP) Copper
- Copperweld® Conductors
- Copper and Aluminum Building Wire
- ACSR and All Aluminum Cable
- Galvanized Steel Guy Strand and Static Wire
- Aluminized Steel Guy Strand and Static Wire
- Aluminum Alloy Wire
- Cable Accessories
- NM Sheathed Cable

• ALSO FABRICATORS OF COPPER AND ALUMINUM FOR WIRE AND CABLE MANUFACTURERS

Again, it was my privilege to be assigned to prepare these specifications and plans, also to make follow-up studies of the performance of the system and to arrange for the addition of any point, as it became available, to the customer Direct Distance Dialing list.

Consideration of the various DDD systems, available at that time, indicated that a SATT system would best meet the needs of the Warren company.

It was further decided that the system would be a Type "BD" system, that is, arranged initially for operator identification of the calling station number and at a later date convertible wholly or in part to automatic identification.

In the study, it was estimated, based on the best information available, that the Direct Distance Dialing operators would be able to answer and "key-up" about 185 to 190 calls per hour, and the first assignments to these positions were on that basis. It was soon found, however, that the operators could answer and "key-up" from 300 to 325 calls per hour without becoming fatigued, or bored due to the repetitious nature of the work if their tour of duty was not too long.

To prevent operators from becoming too fatigued or bored while operating at the Direct Distance Dialing positions, various assignment plans were tried; the present one being the most satisfactory.

This plan provides for no operator working longer than two hours at a DDD position. Her two-hour tour of duty begins either as she starts her tour, or at the beginning of the tour at the end of her lunch hour. As each tour ends at the required time for relief or lunch it is not necessary to provide relief operators for this team.

Different DDD positions are assigned each day. This is done so that each of the 10 positions is occupied for at least one day each week. This method of assignment ensures that each position is in operating condition and can be assigned at any time.

Left to right: Edward J. Lord of Farmville, Va.; George A. Hearne of Kansas City, Mo.; Jack K. Holt of Stilwell, Okla.; William I. Johnson of Glennville, Ga., and J. W. Carter of Smackover, Ark.

It has also been found best, due to the equipment arrangement and to maintain a prompt answer to the trunk signals, not to assign the DDD operators at adjacent positions.

To enable the operating room personnel to know at all times the positions assigned to DDD operation, a small colored card is placed on a hook on the face of the switchboard at each assigned position. These cards are changed, as required, to agree with the assignment plan.

A two-day study of traffic taken shortly after the introduction of DDD indicated that customers were actually dialing approximately 95 per cent of the total estimated potential DDD traffic. It is believed that this percentage is approximately the same at this time. This is due to the splendid reception of this method of completing toll calls by Warren subscribers, the excellent performance of the DDD equipment, and the prompt answer (about two seconds) by the operators.

In December 1956, the first month of operation, 47.3 per cent of the total Warren originating messages were completed through the Direct Distance Dialing system. At present between 55 and 56 per cent of the total messages are being completed through the system.

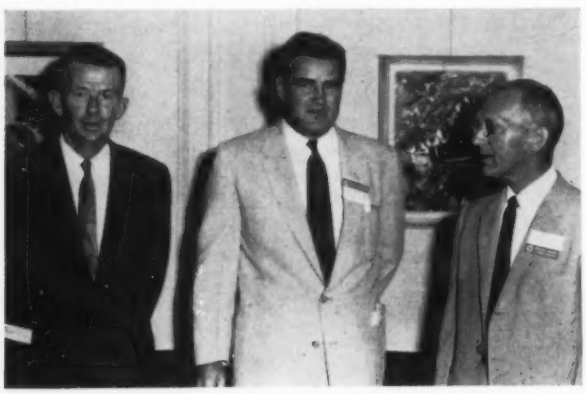
This increase has been due, in part, to our program of adding every possible customer dialable point to our Direct Distance Dialing list and being able to furnish the necessary dialing information promptly when requested by the customer.

Left to right: Irvin Dhyse and Victor Shapley, both of Chesaning, Mich., and P. E. Taylor of Pickford, Mich.

During the latter part of November, nationwide Direct Distance Dialing will be made available to the customers in the Newton Falls exchange area. This should increase the percentage of total messages handled through the DDD system from 55 to 56 per cent to 59 to 60 per cent.

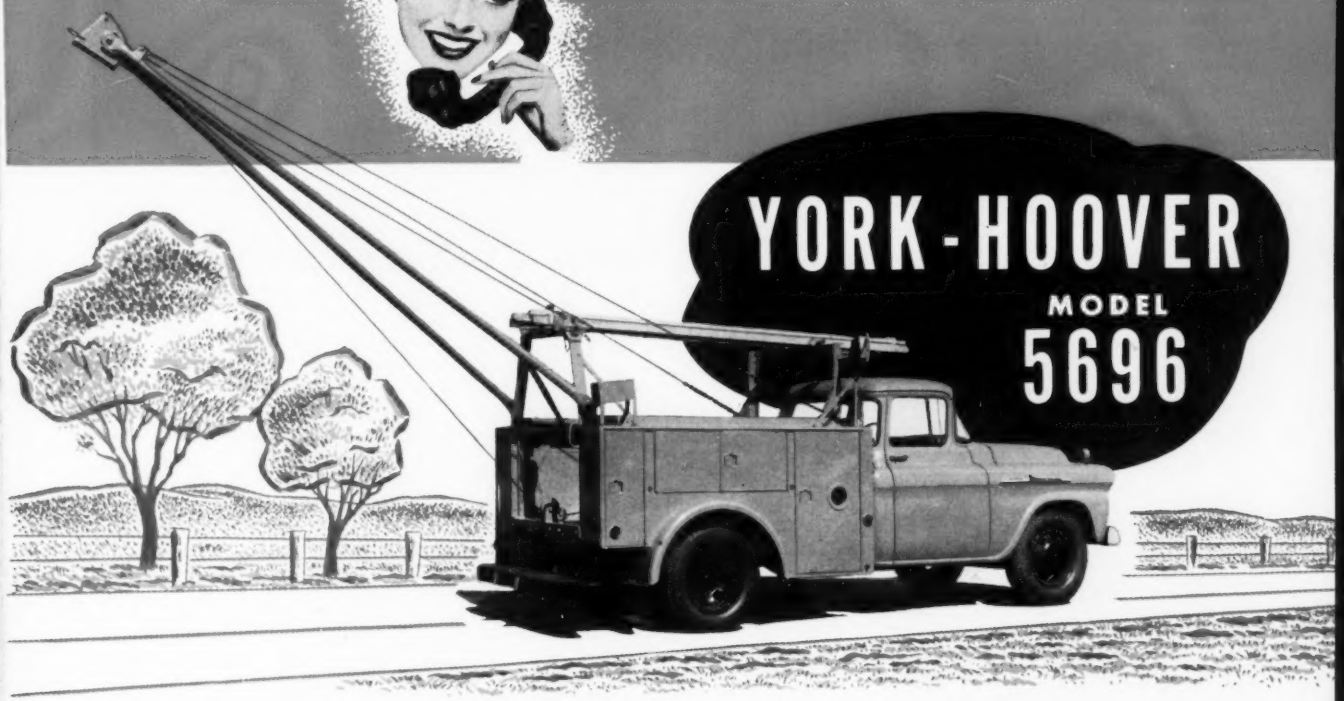
Customer DDD Information

Warren Telephone Directory. Due to the large number of points between 850 and 900, on the Warren DDD list only those points in the home area are



Left to right: Max E. Wettstein of Ocala, Fla.; Robert Eshbaugh Jr. of Leesburg, Fla., and C. C. Leiby of Ocala.

5696 IS A COOL NUMBER



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5696 FEATURES

Mechanically operated derrick readily sets 35' pole

24' extension ladder available for overhead line maintenance

Galvannealed steel side compartments and understructure

Same tread plate floor used in larger line bodies

Compartments contain pull-out drawers, bins and thru box

Illustrating 24 ft. extension ladder pivoting on rear sheave bar with retaining sockets on rear bumper. Ladder can by used away from vehicle. Stored derrick is raised to work position in seconds by use of winch line and winch. Key locks on all compartment doors.

5696 BENEFITS

Moderately priced, extremely flexible in its work functions

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Normal functions of light line job provided by winch and folding derrick

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Dept. 3T, York-Hoover Corporation
York, Pa.

Please send me a copy of Bulletin No. 946 covering your 5696 Combination Unit.

Name_____

Company_____

Address_____

City and State_____

listed in the Warren telephone directory. The directory also states "For specific information about direct dialing to other towns, please consult your Direct Distance Dialing directory or your operator."

"Your Direct Distance Dialing Directory." Each subscriber has been furnished one or more copies of a specially prepared "Your Direct Distance Dialing Directory." This directory contains all necessary instructions relative to placing calls through the Direct Distance Dialing system, a list of the dialable points in the home area as well as a list of the principal cities in the other areas accessible to Warren Telephone Co. customers.

Left to right: J. W. Baker of Spokane, Wash.; P. L. Thoren of Chicago, and B. B. Harder of Sumter, S. C.

Mr. and Mrs. J. D. Garrett Jr. of Lewisville, Ark.

These principal cities are listed alphabetically by states and include the Area Code. The words "and vicinity" follow the name of each principal city. This is to indicate that locality points within the exchange areas as well as many of the near-by points are accessible by Direct Distance Dialing.

The directory also contains several pages for the listing of personal numbers and information.

To enable operators to quickly answer inquiries as to whether a particular point is dialable by the customer and, if so, furnish the area code if required, the following procedures have been adopted.

Switchboard Bulletin. Of the points listed on the switchboard bulletin a small red triangle is placed to the left of each of the points dialable by the customer.

The absence of an area code, in the routing instructions, indicates that the point is in the home area and no area code is required and the customer need dial only the access code and the first two letters of the central office name and the five numerals of the listed number.

If the point is in an area other than the home area, the area code is underlined in red. In some instances, due to special routing instructions for the operator, it was necessary to insert the area code, underlined in red, opposite the name of the point. On calls to these points the customer must dial the area code in addition to the access code and the two letters and five numerals of the listed number.

Points Not On Switchboard Bulletin. The operator receiving a request as to whether a point not on the switchboard bulletin can be customer dialed, inserts the other cord, of the pair of cords used in answering the customer, in an idle trunk to the Toll Rate and Route Desk, and passes the request to the Route Operator.

In front of each state in the Toll Rate and Route Guide is a list of all toll centers in that state and the authorized route.

If the toll center is accessible by customer dialing, it is underlined in red. The area code, if in an area other than the home area, is also underlined in red, Here, again, due to special routing instructions it is necessary, in some instances, to insert and underline in red, the area code.

The Route Operator receiving an inquiry as to customer dialing possibilities to a particular point, first looks at the toll center list of the proper state. If the point is on this list and is underlined in red, she advises the operator that the point can be customer dialed and advises her of the proper area code. If the point is on this list and is not underlined in red she advises the operator that the point is not accessible for customer dialing.

If the point is not on the toll center list, the Route Operator then looks through the list of stations to determine, first, if the point is listed as "2 L + 5" and second the toll center. She then refers to the toll center list to determine if the toll center is underlined in red. If the point in question is listed as "2 L + 5" and the toll center is underlined in red, the Route Operator advises the operator that the point can be customer dialed and the proper area code if required. The switchboard operator so advises the subscriber. Unless the point in question meets both of these conditions, the subscriber is advised that the point is not accessible for customer dialing.

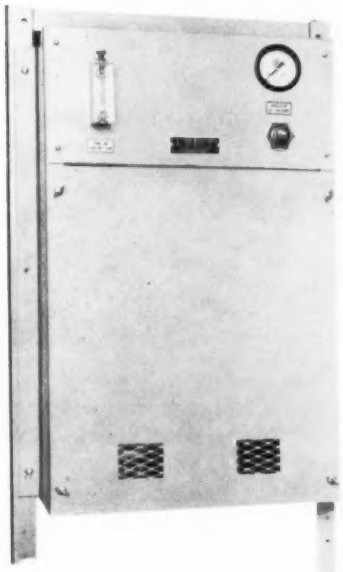
This method is similar to the method for determining regular routing information and has eliminated the need for another special record. Warren Tele-

Left to right: W. J. Holladay of Fayette, Ala.; B. Monty Fobes of Tomah, Wis., and Mrs. Fobes.

NOW! from S&G MANUFACTURING CORP.

THE MODEL "R" DEHYDRATOR (AUTOMATIC)

for pressurizing aerial and underground telephone cables



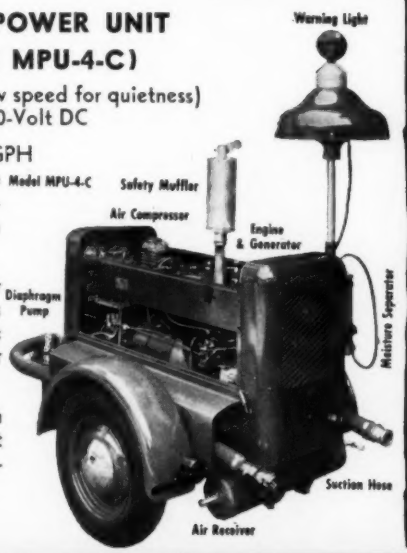
The Model "R" Dehydrator is designed to supply dry air to telephone cables. Among its many outstanding safety features are:

- Hi-Lo pressure switch for alarm
- Humistat for alarm above 4% R.H.
- Power failure relays and separate fustat
- By-Pass Valve & Alarm for excessive R.H.
- Mechanical control valve for stand-by air supply (O.P.N.) in event of power failure
- Additional safety features on air compressor
- Power supply is 115-volt, AC on the Dehydrator and Air Compressor
- Power consumption—2 AMPS

The Model "R" Dehydrator (Automatic) is designed for small installations of 80 miles or less of cable. It is a wall or relay rack-mounted type, approximately 24" high, 28" wide and 8" deep. Operating voltage is 115 volts, 1 phase, 60 cycle, and the output is 700 standard cubic feet per day maximum, with a dewpoint of —40°F. and power consumption of 2 AMPS.

MOBILE POWER UNIT (Model MPU-4-C)

- Generator (slow speed for quietness) 2500 Watt, 110-Volt DC
- Pump—2800 GPH Diaphragm to remove seepage and drain back
- Air Compressor —to put cables under pressure for cutovers or repairs
- Furnished with or without pump and compressor.



MODEL "A" Air Compressor Dehydrator

Exchange unit equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 60 cables. It is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

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phone Co. has found it to be a most satisfactory method.

PABX and PBX Traffic

One of the frequently asked questions has been, "How well has Direct Distance Dialing been accepted by the PBX and PABX users." To find the answer to that question the toll statements, for one billing period, of 70 of the approximately 150 PBX users were analyzed to determine the percentage of messages completed through the Direct Distance Dialing system of the total toll messages of these customers.

The 70 toll statements analyzed were made up of 15 steel manufacturers and fabricators, 10 financial institutions, six electrical product manufacturers, three automobile sales agencies, six health and welfare agencies, three transport companies, and 27 miscellaneous concerns.

Of the 28,780 messages analyzed 15,760, or 54.8 per cent, were completed through the Direct Distance Dialing system and 13,020, or 45.2 per cent, were operator handled. The 54.8 per cent completed through the DDD system for the PBX users compares very favorably with the 56.2 per cent for the entire office for the month of July. It seems to indicate, also, that the PBX users as a group have favorably accepted the Direct Distance Dialing system for the completion of their toll calls.

While the PBX users as a group have favorably accepted the DDD system there is wide variation in the degree of acceptance by the various groups and individual PBX users.

Of the groups previously mentioned, the financial institutions had the highest percentage of messages (80.8 per cent) completed through the DDD system, while the steel manufacturers and fabricators had the lowest (40.7 per cent). The range for the individual users was from 8.6 to 95.5 per cent.

It is believed that if some method were devised whereby the PBX station making the call could be identified in order for the company to properly allocate the cost of their telephone service to their various departments, and if the handling of person-to-person calls through the DDD system, as mentioned in the September *Readers Digest*, is successful, the use of Direct Distance Dialing by PBX users will be greatly increased.

John Aigler (left) and W. O. Pinyerd, both of Bellevue, O.

The analysis brought attention to many interesting comparisons. I will take time to call your attention to only one of them. There were 70 messages for the YMCA of which six, or 8.6 per cent, were completed through the Direct Distance Dialing system. During this same period, however, there were only 24 messages for the YWCA of which 16, or 66.7 per cent, were completed through the DDD system. Now, then, who talks the most and who is more ready to accept new methods and ideas, men or women?

Traffic Increase?

One question of paramount interest to toll operating and management personnel is, "What increase, if any, will there be in our toll traffic with the installation of a Direct Distance Dialing system?"

This is a most difficult question to answer as DDD attempts and toll board offered calls cannot be added together for comparison with records of previous periods. We did, however, attempt to obtain a measurement in Warren by using message data.

The increase in messages for each of the months of January, February and March over the corresponding month of the previous year for the years 1953 through 1956 was 6 per cent. However, the increase in January, February and March of 1957 over the corresponding months of 1956 was 10, 10.5, and 8.5 per cent, respectively, or an average increase of 9.7 per cent. It seems reasonable, therefore, to assume that an increase of from 3.5 to 4 per cent was obtained by the installation of the Direct Distance Dialing system.

Major Considerations

I would like to outline briefly some additional items which I believe not only affect traffic operation and saving but influence to a great extent the customer's acceptance of Direct Distance Dialing.

(1) Adequate Trunk Provision. Access trunks to the Direct Distance Dialing system should be provided on the basis of the customer encountering a busy trunk condition not more than once in each one hundred attempts.

Trunks in final groups, as well as trunks in those groups which do not have access to a final group, should also be provided on the basis of the customer encountering a busy trunk condition in not more than three attempts in each 100 attempts.

Operator trunks or the trunks provided to connect the customer to an operator, for the recording of the calling customer's telephone number in the DDD system, should be provided on a "no delay" basis and each trunk should be arranged for answering by any DDD operator.

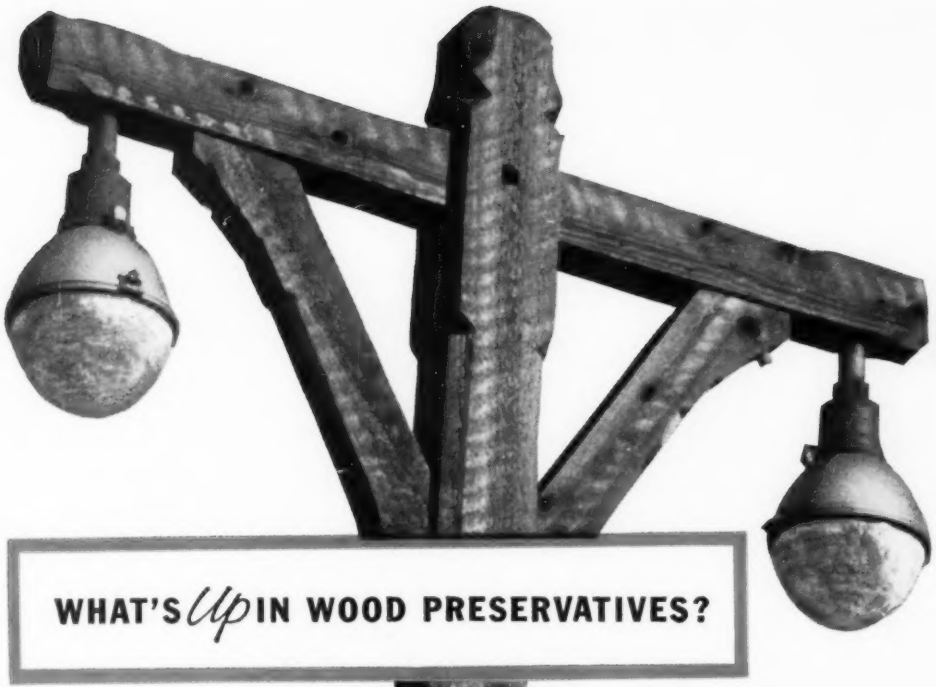
(2) Adequate DDD Equipment. All directing, storing, timing and recording units should be provided on practically a "no delay" basis. They should not only be adequate to care for the normal day-to-day fluctuations, but there should be sufficient margin to care for unusual peak periods without unduly delaying the customer.

(3) Adequate Operator Positions. Where operator identification of the calling customer is used, adequate positions, as well as adequate operator trunks, should be provided. A sufficient number of these positions should be provided to enable the force to be increased to meet any load condition and still maintain a prompt answer.

Where special positions, on a separate line of switchboard, are provided for this purpose, there may be some

(Please turn to page 158)

Left to right: Harold Thompson of Clear Lake, Ia.; E. G. Carlson of Creston, Ia., and Leith Johnson of Northlake, Ill.



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Maleic Anhydride • Sebacic Acid • Ortho-Phenylphenol • Sodium Sulfite
Pentaerythritol • Pentachlorophenol • Sodium Pentachlorophenol
Sulfuric Acid • Methanol

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Courts and Commissions

Utility Anti-Strike Law Upheld by Mo. High Court

The Missouri Supreme Court during the week of Sept. 29 ruled constitutional all the provisions of the Missouri public utility Anti-strike Law which had been questioned by three unions in an appeal of an injunction (TELEPHONY, Feb. 15, 1958).

Known as the King-Thompson Act, the law permits state seizure and operation of any vital public utility when a work stoppage is threatened. Those responsible for a strike or lockout may be penalized by heavy fines under the act and workers jeopardize their job seniority if they refuse to continue work during a period of state seizure.

Three labor unions, which had engaged in a strike against the Laclede Gas Co. of St. Louis, appealed an order by Circuit Judge Ivan Lee Holt Jr. granting the state an injunction against the unions.

The strike started on July 1, 1956, following which the company was seized by former Governor Donnelly for operation by the state. The unions refused to return to work and the state brought suit against them to enjoin them from participating in a work stoppage. The injunction was granted July 13, 1956 and the unions returned to work the next day.

This decision of the Missouri Supreme Court is the first time the constitutionality of the entire act has been decided.

Morris J. Levin, representing the unions, had argued that the law should be declared invalid because it conflicted with the National Labor Relations Act and the Taft-Hartley Act. He gave as supporting data the fact that a Wisconsin utility anti-strike law had been invalided by the U. S. Supreme Court.

The Missouri Supreme court said:

"The dominant purpose of the King-Thompson Act is the protection of the health and welfare of the people when threatened by the interruption of services of utilities operating under governmental franchise or permit. . . . It is an exercise of the police powers of the state. . . . This is consistent with the policy of the (federal) Labor Management Relations Act."

The court went on to say that since utilities cannot be considered wholly separate from their employes, Missouri Public Service Commission law recognizes this and imposes penalties on employes as well as on utilities for their wrongful acts.

"The exercise of the state police power is superseded only where repugnance or conflict with a federal act is so direct and positive that the two acts cannot be reconciled," the court ruled.

In setting aside the Wisconsin act as a precedent, the court maintained that the statutes involved are substantially different. The Wisconsin act provided for compulsory arbitration; the Missouri act does not. The Wisconsin act provided for a ban on strikes. The Missouri Act does not render a strike unlawful until determined by the governor that public interest is threatened.

The court refrained from expressing an opinion on the constitutionality of the act's provisions for loss of seniority and monetary penalties. It said that no case had been made for determination of this.

On the point that the act contravenes the right to strike, the court ruled the law does not abolish this right but only subordinates it to the public interest which is the state's right under its police powers.

The unions had contended that the act's provision for seizure is an unlawful delegation of legislative power.

"The deficiencies of this act in this regard are not pointed out specifically," the court said. It went on to indicate that the legislature describes the purpose in an act with detail being left to the executive.

One provision in the act reads that:

"It shall be unlawful for any person, employe, or representative as defined in this chapter to call, incite, support or participate in any strike or concerted refusal to work for any utility or for the state after any plant, equipment or facility has been taken over by the state under this chapter, as means of enforcing any demands against the utility or against the state."

The unions claimed that this provision is so vague and indefinite that it violates the rights of free speech, peaceable assembly, due process, and other constitutional guarantees.

The court said that it did not think the language is fatally vague or indefinite and that it could be commonly understood.

As for denying the right of free speech and peaceable assembly, the court cited a decision of the Supreme Court of New Jersey which said that ". . . such restraints are justifiable only 'to prevent grave and immediate danger to interests which the states may lawfully protect' and any such restraints must be reasonable."

The court then said that the defendants (the three unions) did not show any interference with assembly or freedom of speech or that picketing had been forbidden. Picketing, the court said, is not an unqualified right, but is also subject to police power.

As to the contention that this provision denies utility employes equal rights and opportunities under the law, the court declared that it is within legislative authority to classify and deal with businesses connected with the public interest.

As for the interpretation that this provision imposes compulsory service, the court found the unions' interpretation strained and unwarranted.

Southern Bell Rate Plea Turned Down in Louisiana

The Louisiana Public Service Commission on Oct. 10 conceded Southern Bell Telephone & Telegraph Co. deserves some increase in rates but ruled the company can't have any raise because it has behaved "arbitrarily." (TELEPHONY, Mar. 8).

In a formal order which, in effect, throws out Southern Bell's application for a 13-million-dollar increase in rates, the three-man commission said a $1,-918,707 raise would be "just and reasonable."

But it denied the application "in its

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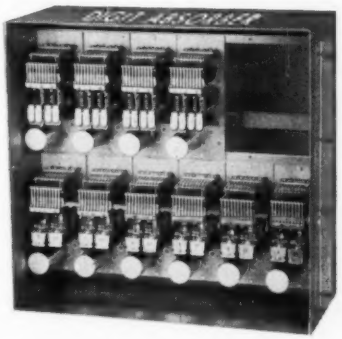

Digit absorber case requires 17" on a 19" relay rack. Capacity 12 units.

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Few dial switchboards of earlier design have provisions for adding digit absorbing features economically. The Universal Digit Absorber fills this need easily and at nominal cost. Installation requires very little time and does not interrupt service.

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There are two types of Universal Digit Absorbers, depending on the complexity of the exchange codes assigned:

19-S unit will handle exchange codes, as illustrated by AB-X, where the "X" digit is not a duplicate of the "A" or "B" digit.

19-L unit is required where the "X" digit is a repeat of either the "A" or "B" digit.

In addition, Universal offers a Trunk Digit Register which can be applied to "Trunk on Line" dial boards where five or more digits are required to be delivered to a 3 or a 4 digit tributary exchange. This unit also affords added link hunting time and safeguards against partial digit registration.

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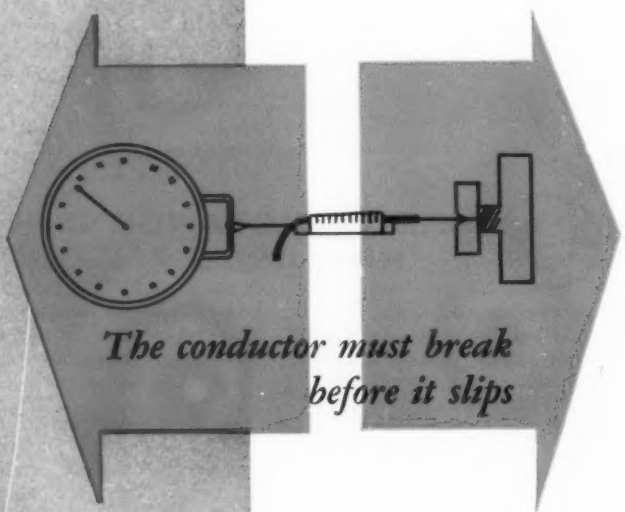
ALPHADUCT

P clamp adhesion test



The conductor must break before it slips

P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

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Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

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THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

entirety" on the ground that the company had supplied its Louisiana subscribers with "grossly inadequate service."

The company, the commission charged, has "arbitrarily curtailed a necessary expansion program in this state, thereby failing to perform its obligations as a public utility to such an extent as to require the commission to deny to the company the increase to which it would otherwise be entitled."

The formal order left the way open for the company to apply for the $1,918,707 boost "at such time as it can offer satisfactory proof that it is rendering adequate service to its Louisiana subscribers."

Southern Bell's cited basic reason for its application was that present earnings are not sufficient to permit borrowing money for badly needed expansion in Louisiana.

Company officials indicated they will appeal the decision immediately to Baton Rouge district court. Homer Bartee, Louisiana general manager, said, "The decision is a severe blow to Louisiana's growth and development and to continuing telephone progress.

". . . We have no alternative but to appeal the commission's decision to the courts."

Southern Bell asked for the increase in August 1957, following a commission-ordered rate cut in 1956, which was sustained by the state supreme court. Under that court decision the company was forced to refund to subscribers nearly one million dollars.

Returns since then, the company claimed, had shown a revenue cut 1.9 million dollars deeper than the commission had calculated—as the recent order tacitly admitted.

Incorporation, Stock, Rate OK For Ala. Company

The Alabama Public Service Commission on Sept. 30 approved the application of the Hopper Telephone Co., Altoona for incorporation.

The company also was granted permission to issue $300,000 worth of common stock.

A new schedule of rates applicable to the new automatic system being installed also was approved by the commission.

Raise Hearing Set in W. Va.

The West Virginia Public Service Commission set an Oct. 3 hearing date on the application of the Short Line Telephone Co., Pine Grove, to increase its rates by $16,179 annually. The raise would be effective for the company's Hundred, Littleton, Smithfield,

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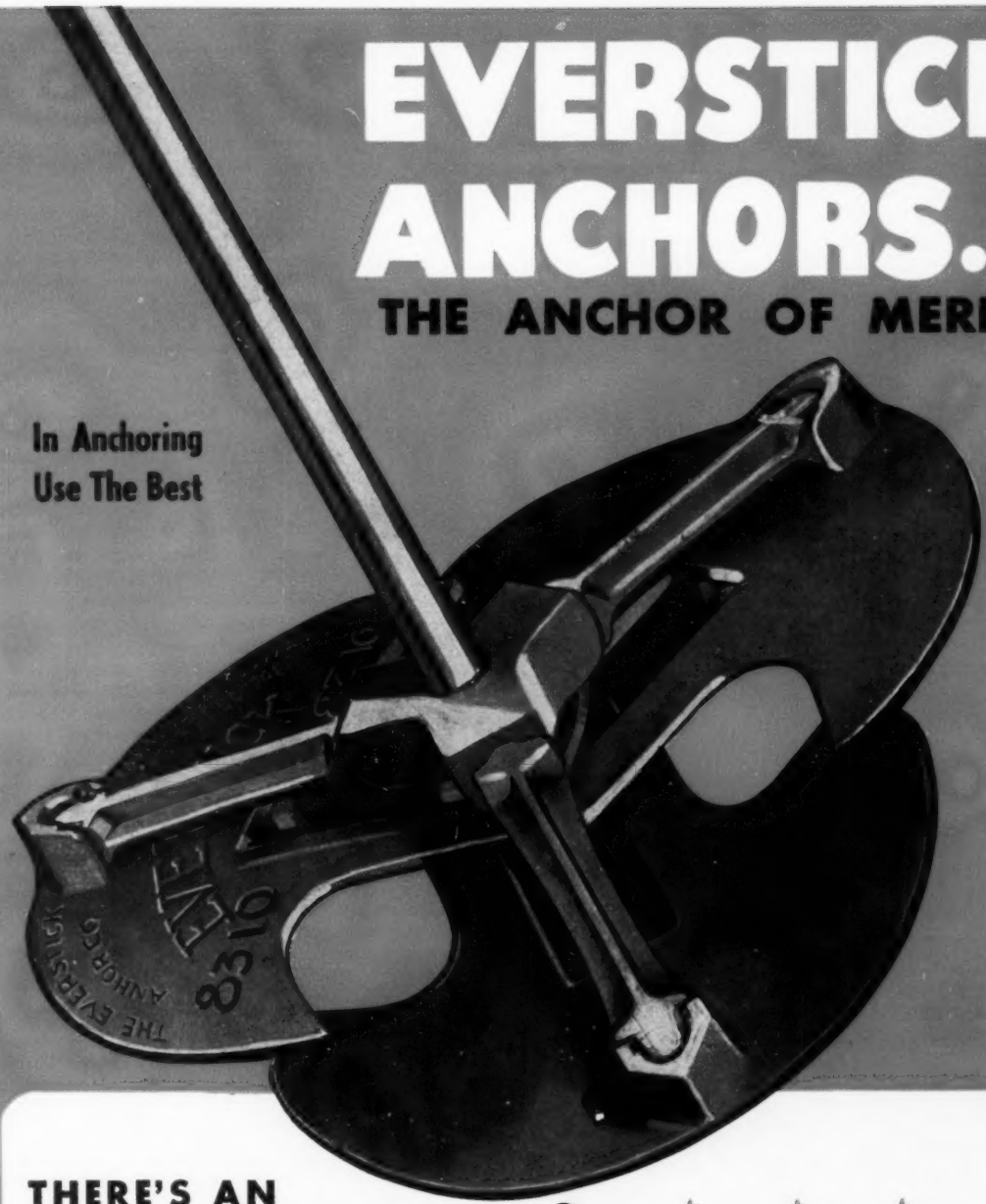

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The Everstick Anchor Co.
FAIRFIELD, IOWA

Pine Grove, and Wadestown exchanges serving 1,833 subscribers.

AT&T Lowers Rate Request For Teletypewriter Service

American Telephone & Telegraph Co. on Oct. 16 asked the Federal Communications Commission for permission to reduce its proposed increased charges on private line teletypewriter service (TELEPHONY, Oct. 4).

The company had asked to increase revenues from this service 26 per cent. It now proposes to revise rate schedules to limit the increase to 22 per cent. The proposed change would cut revenues from 11 million dollars to 9½ millions. Western Union Telegraph Co. wants to reduce its rate raise to 23 per cent.

Approve Rate Increases For Two Minn. Companies

The Minnesota Railroad & Warehouse Commission on Oct. 6 approved the application of the Western Telephone Co., Springfield, for authority to raise rates.

The Western company has invested $67,000 in plant since acquiring the Springfield property in 1952 and its current rates give it a net income of $11,837, out of operating revenues of $92,672. This provides the company with a rate of return of 4.75 per cent on a rate basis of $246,961. Under the new rates, operating revenues increase to $98,755 with expenses rising to $83,959. This gives the company a net income of $14,796 providing it a 5.99 per cent rate of return.

The Springfield exchange provides common battery service to 1,042 local and 438 rural stations.

Old and new net rates are as follows:

	Old	*New*
One-party business	$6.50	$7.00
Two-party business	5.75	6.25
Multi-party rural business	4.30	4.75
One-party residence	3.25	3.60
Two-party residence	2.70	3.10
Four-party residence	2.25	2.60
Multi-party rural residence	3.25	3.60

•

Also on Oct, 6, the commission approved the application of the Blue Earth Valley Telephone Co., Blue Earth, for a rate raise.

The company has, since 1952, increased its plant investment by $180,000 and is planning to convert the Guckeen and Huntley exchanges to automatic operation in about September 1959.

Under the old rates, the company had operating revenues of $290,360 with total expenses of $272,420, giving it a net income of $17,940. On the rate base of $685,966, this provided the company with a rate of return of 2.61 per cent.

With the new rates, operating revenues will increase to $345,474 with total expenses of $311,196, providing the company a net income of $34,278. The company's rate of return under these new rates will be 4.99 per cent.

The company operates exchanges at Blue Earth, Wells, Winnebago, Guckeen, and Huntley serving 5,015 company-owned stations and 902 switchline stations.

The company's old and new rates are as follows:

Blue Earth, Wells, Winnebago, Elmore; Manual

	Old (Gross)	*New (Net)*
One-party business	$3.25	$5.00
Two-party business	3.00	4.50
Multi-party rural business	2.75	3.00
One-party residence	2.25	3.00
Two-party residence	2.00	2.50
Three-party residence	...	2.25
Four-party residence	1.75	2.00
Multi-party rural residence	2.50	2.50

New automatic rates to be effective on conversion for the Guckeen and Huntley exchanges are as follows:

One-party business	$6.00
Two-party business	5.00
Multi-party rural business	4.75
One-party residence	4.50
Two-party residence	3.50
Three-party residence	3.25
Four-party residence	3.00
Multi-party rural residence	3.75

Manual rates will be effective after Oct. 31. The automatic rates will become effective after conversion.

To Rehear N. C. Voiding Of Franchise Agreements

The North Carolina Utilities Commission on Oct. 14 granted a petition for a rehearing of its Sept. 4 order which directed the Carolina Telephone & Telegraph Co., of Tarboro, to stop providing free service to municipalities in exchange for franchises, but indications are that the matter is headed for the courts for a test (TELEPHONY, Oct. 18).

The rehearing, set for Nov. 13, will be only on the free service ban and was granted upon petition of the city of Wilson, although other municipalities which have been receiving such free service will be permitted to present evidence. Free service or reduced rates to parties other than municipalities also are involved.

In its Sept. 4 order, granting Carolina T&T a rate increase of 1.5 million dollars, the commission called for a halt to its practice of giving free service to cities and charitable institutions. Last year, the company granted free service or reduced rates which would have netted it $41,873 and the commission served notice on Carolina T&T and all other telephone companies that in the future, the revenue they would have received without free service will be taken into account in figuring their profits for rate-making purposes.

Elimination of the free service to municipalities drew protests from the municipalities involved and the city of Wilson filed a petition asking for a rehearing on this portion of the order, stating that it was "arbitrary, vague . . . and unsupported by any competent hearing . . . or proper investigation into the facts." In its petition, the city of Wilson contended that such service is not free but is rendered "for a valuable consideration."

In granting the request for the rehearing, the commission noted that testimony developed at the rehearing would be necessary in Wilson's announced plans to test the order in the courts. It indicated that it would not back down in its position, which holds that free service under the agreements violates the law because it discriminates against other customers and amounts to a franchise tax.

O. Bell, Independents, Ask to Take Over Mutuals' Service

The Ohio Bell Telephone Co. on Oct. 3 asked the Ohio Public Utilities Commission for permission to purchase the facilities of the New Riegel Mutual Telephone Co. and part of the Alvada Mutual Telephone Co.

Asking to serve the rest of the Alvada company's territory were the Arcadia Mutual Telephone Co. and the Vanlue Mutual Telephone Co.

Three Ask Sale OK in Wis.

Wisconsin's Public Service Commission on Oct. 22 was to have heard the joint application of Prairie Farm, Ridgeland & Dallas Telephone Co., the Dallas Cooperative Telephone Co. and the Hillsdale Western Telephone Co. for authority to sell their properties to the Chibardun Telephone Cooperative, Inc.

Schedule Mo. Rate Plea

The Missouri Public Service Commission on Oct. 10 set a hearing for Oct. 29 on an application by the Mark Twain Rural Telephone Co., Bethel, to increase rates.

OK WL&T Raise in Kansas

The Kansas Corporation Commission on Oct. 9 authorized Western Light & Telephone Co. Inc., Great Bend, to increase its telephone rates by $26,129 to 2,612 subscribers in Kiowa, St. John,

(Please turn to page 162)

the BUS BROWN TRENCHER

MODEL 346

THE BIGGEST LITTLE TRENCHER IN THE WORLD
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   Ball Bearings, permanently sealed.
7. Trenching Width and Depth —
   3 inches wide up to 5½ feet deep.
   4 inches wide up to 3½ feet deep.
   6 inches wide up to 2½ feet deep.
   (Obtained by different length booms and boom control).
8. Self-Propelled — Drives on all four wheels while digging, rear wheels while in transport gear.
9. Hydraulically Controlled Digging Boom

The digging chain on Bus Brown Trenchers has been proven to be the most economical digging chain ever used.

TRENCHING IS MORE PROFITABLE WITH THE BUS BROWN TRENCHER MODEL 346 WHICH OFFERS:

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- Maximum Efficiency at Minimum Cost
- One Man Operation Eliminates High Labor Costs
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- Digging Speed and Maneuverability Leads to Faster Job Completion
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  Eliminates High and Extensive Maintenance Costs
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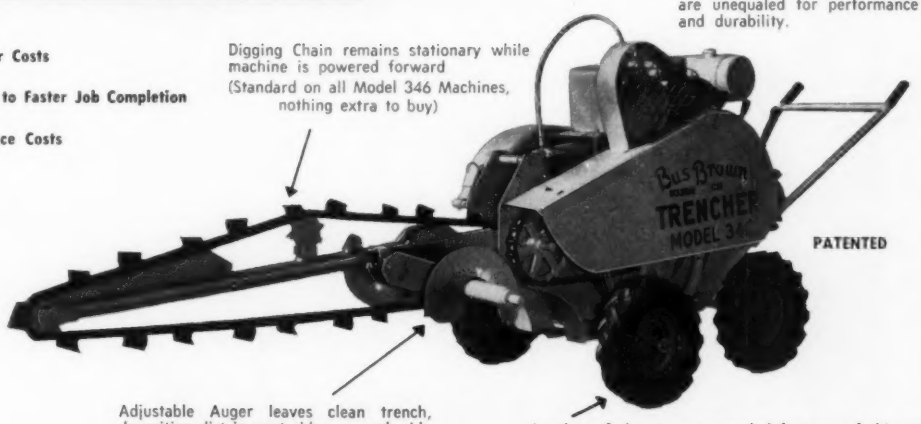
The cutters on the digging chain are unequaled for performance and durability.

Digging Chain remains stationary while machine is powered forward
(Standard on all Model 346 Machines, nothing extra to buy)



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Adjustable Auger leaves clean trench, depositing dirt in neat ridge on each side of trench for easier backfill.

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INDEPENDENT TELEPHONY MARCHES ON

Continued from page 29

of you who read our member letters —and I hope you all do because if you don't you are overlooking a lot of vital information—know that our radio department has not been inactive. In fact, we have suffered so much fall-out from the FCC, which is located directly across the street from our Washington headquarters, that you might say we have become radioactive!

Seriously, this matter of adequate radio frequencies for our companies is no laughing matter, and I cannot overemphasize the importance of it. You will recall that some months ago the FCC served notice that we are to lose frequencies in the 890-940 band which some of our companies have been using for point-to-point services instead of wire lines. While we can still operate on these frequencies, we ultimately will have to give them up because the FCC says they are needed for national defense purposes. As of the present, adequate replacement frequencies have not been allocated by the FCC, but our association has been and is actively engaged in an attempt to solve this problem.

As most of you know, the FCC did establish a new service, effective Aug. 1, known as Telephone Maintenance Radio Service. This is a great new application of radio for which we have been fighting for some time, giving the telephone industry radio frequencies it can use in its construction and maintenance activities separate from those on which it must furnish a service to the public. When these frequencies were granted, our association was amazed at the number of inquiries regarding them from many of the smaller companies. It is evident that many companies are finding the use of mobile radio in their operations to be of practical and economical value.

So you see we are actively looking out for the interests of Independent companies in the radio field. There is evidence on every hand that radio is to be one of the chief tools of the future as the telephone business tends to get off the ground via land lines and go through the air waves.

Radio and toll compensation are but two of the areas in which our association concerns itself. Our additional activities are too numerous to detail here, but the fact is our organization is the national workshop, conducted on behalf of thousands of Independent telephone companies, both large and small, that comprise an important segment of the American economy. The association is the mouthpiece of these companies in matters of common concern arising in various government departments in Washington, in the halls of Congress, and in relationships with the Bell System and other business enterprises. That is why I say that no Independent telephone company can afford not to be actively affiliated with the United States Independent Telephone Association.

Isolationism Dangerous

These are times of revolutionary scientific developments, many of them bringing shattering economic and sociological changes; these are days of international tensions, when most nations are striving with often frustrating efforts to establish working principles for a reasonable degree of world harmony. These situations lend emphasis to the need for hanging together in the face of common perils. Isolationism for a single company or a single industry is dangerous.

Whether we like it or not, we shall continue to find ourselves targets of unfair political and economic attacks by the enemies of our private enterprise system. And, so, today, I feel that we have a demonstrable need for a new unity, a new feeling of mutual relationship among those who have faith and confidence, as well as a financial stake, in the private enterprise system. If we tolerate each other's differences of opinion, if we learn how better to get along with each other, if we adopt the right mutual attitude and spiritual philosophy, we will regard the future as a great adventure. Adventure has been defined as a state of mind—and spirit. It comes through *faith* and with complete faith there is no fear of what faces us—in life—or in death.

Faith, we are told, is the substance of things hoped for. With faith, it is as easy to reach for the moon as it is to reach for the top of the fence that hems us in—if one mixes with it a little ambition and imagination. Even a child can thrill to the promise: "Ask and it shall be given to you; seek, and ye shall find; knock, and it shall be opened unto you."

Must Work Together

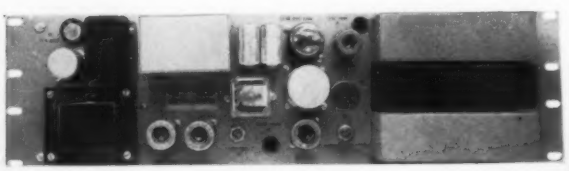
Recognizing that our industry is being confronted with a new challenge in carrying out its traditional public service obligation, we will need to work with each other in meeting our problems as we come into our common heritage.

(Please turn to page 122)

BUDELMAN

46A

POSTPAY PAYSTATION CARRIER



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How can we work more closely together? The answer is right here—right in this room. Obviously, this is a role designed and made to order for the industry's state and national trade organizations. Here, in the United States Independent Telephone Association, we have the means and the mechanics, if you please, for checking our progress, for propelling our movement forward, for protecting our common interests, and for jointly facing up to the job that lies ahead.

To grasp the meaning of what our association can mean to us, you have only to observe the attendance at this convention and consider the program which is before you. What your association has done in the past year can be done even better in the future if we only realize the potential of this instrument within our hands, our own USITA.

Consider well what has been done about better legislation, better public relations, better employe recruitment policies. Consider well what we have been able to develop by way of sound advice on better accounting, commercial, traffic, engineering and plant practices, and our help to the small companies.

This is the mood in which, I hope, you will appraise all these things unfolding before your eyes and ears at this convention. It is all good; but it could be even better, if we only realize the immensity of the job ahead and the benefits to be gained from active enthusiastic participation in the work of this association.

Never have we been better prepared for important service to our companies than now. Our *Program of Work* contains a large number of vital projects. With the help of all of you we can go forward to new achievements.

I have confidence that we are going to do these things.

And may the good Lord bless and keep you 'til we meet again!

WE ARE ALL PART OF GREAT INDUSTRY

Continued from page 43

out of the duties and responsibilities to be vested in it under the expected enactment.

"We have advised Administrator Wickard of our desire to be of service to him in the administration of the law and our willingness to give him the benefit of our experience in dealing with the problems he will inevitably face, particularly in the early stages of carrying out the terms of the legislation."

The administrator, Mr. Wickard at the time, accepted our offer of cooperation, and a meeting was held with him in his office in the Agriculture Department Building in Washington within a few days thereafter, participated in by USITA officers and representatives of our Small Company Committee.

I have referred to this little bit of history in order to lay the ghost to some of the tales that have been spread by some people about the part which the USITA played in the enactment of federal legislation. That part was one that helped save the telephone industry from the beginning of public ownership; it saved the telephone subscriber from the possibility of having duplicated service in many communities and being compelled to pay two separate telephone bills; and it helped make the legislation as finally agreed to a much more workable plan in other important respects.

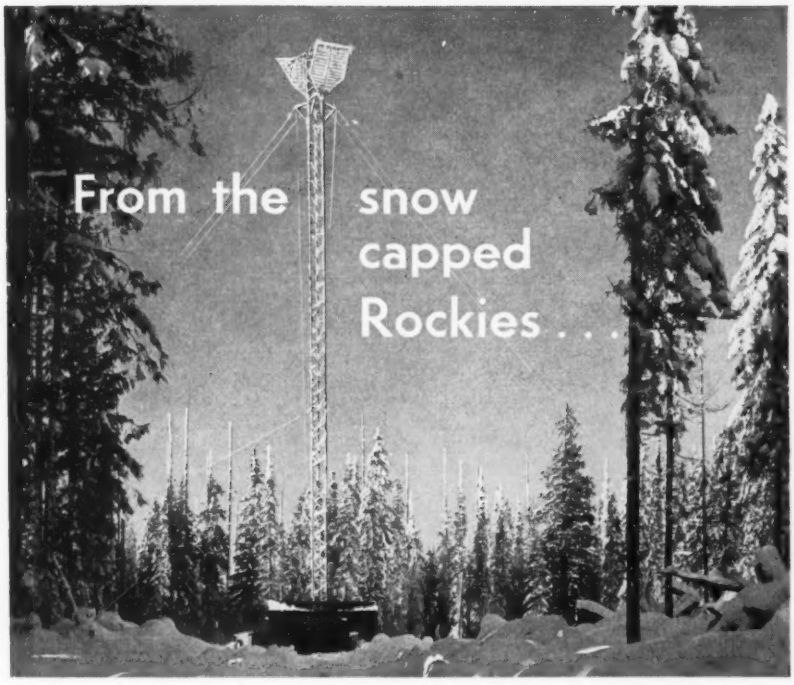
I am going to do some straight talking here. When it comes to telephone trade organizations, there is only one real one in the nation. It is the USITA which has behind it six decades of service—a kind of service and a quality and quantity of service that have won for the organization the deserved thanks and gratitude of those who have been members, and at least the respect of the few that have been willing to enjoy a free ride without being members. Let me emphasize that in dealing with national affairs, there is no merit or advantage whatever in divisiveness. Those providing telephone service, I am confident, will support the trade organization that, over the years, has delivered the bacon, that has provided a high quality of leadership, that has a full-time competent, trained, professional staff, that has well-informed and helpful committees that serve as valuable reservoirs of information and advice available upon call, that has numerous monuments to its effectiveness on the legislative battle field and in toll compensation and other matters, and that has demonstrated that it not only has a capacity for real service, but actually renders that service and has been rendering it for many years.

Based on official action taken by our board of directors on several occasions, the heart of the USITA is big enough to embrace any company, cooperative, or other telephone organization regardless of its corporate or other identity, and regardless of whether it borrows from the REA, a local bank, individual investors, or an insurance company. The only qualification is that it must be a part of the Independent telephone industry, not affiliated with the Bell System. We have respect for our friends in the Bell System and have many business and friendly relationships with them, but under our by-laws they alone are not eligible for membership. Maybe I should add that the Bell System has never sought membership. I believe it shares our view that it is far preferable that the Independent segment of our industry have its own association, with however suitable mechanism for cooperation between the two branches of the industry wherever necessary in order to assist in providing a national communications service to the American people.

In my humble opinion, I stand second to none in a genuine respect and sympathetic regard for the welfare of our smaller companies. In my, perhaps, ineffective way I know I have devoted a great deal of time and attention to their problems. I have not succeeded in doing all I set out to do, but I want to assure you that my loyalty to the cause of Independent telephony, as it has been known and grown and prospered, continues in undiminished form. As a member of the USITA board of directors, I pledge the continuation of this loyalty.

But, let me refer again to the decision of the USITA respecting REA borrowers, as declared by our managing body. As far back as 1952, our board of directors adopted a resolution putting its stamp of approval on REA loans for those Independent companies that have exhausted other sources of capital, or that may find it necessary or desirable in their own independent judgment to borrow from the government. The same resolution stated the directors believed that many of the objectionable terms and conditions in the original REA loan documents had been eliminated and that these documents are now reasonable and just.

I know something about those documents. While Mr. Wickard was still REA administrator, I worked long and hard in my office at Bellevue, O., and at repeated conferences with REA people in Washington, in revising the mortgage note and associated loan papers. A total of 28 changes, some of them significant, were made in these documents, and they apply alike for the protection and benefit of all borrowers, whether they be commercial companies or cooperatives. The REA recognized the merit of these changes and put upon them its stamp of approval. While not perfect—nothing is perfect in a world in which there are human frailties—I believe these documents today are in some respects more liberal than many similar documents of private lending institutions. It is to these documents that our board of directors six



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- —Preparation of the site; Construction of roads and buildings
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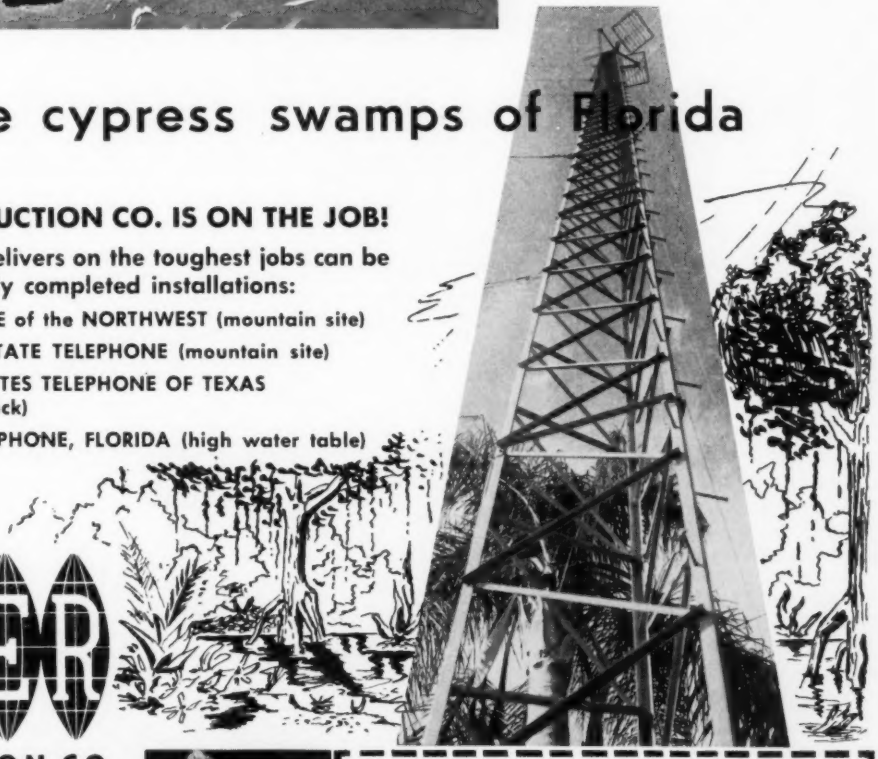
. . . to the cypress swamps of Florida



TOWER CONSTRUCTION CO. IS ON THE JOB!

Proof that TOWER delivers on the toughest jobs can be seen in these recently completed installations:

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years ago addressed itself in the favorable terms I have described.

There is another aspect to the REA telephone lending program. It is enabling many small Independent commercial companies to improve and extend their service and continue in existence as important parts of their communities. It is helping other companies to finance the acquisition of adjacent companies and become, with greater combined resources, more self-sustaining and better able to employ competent personnel with resulting improved managerial, supervisory and technical talent available to render service to the telephone using public. But, it is helping to do even more than this. It is also preserving many Independent companies as essential parts of the Independent industry. And in doing this, it is tending to assure the preservation of Independent telephone manufacturers and healthy competition among them. This, too, is in the public interest.

There are a number of problems that are peculiar to REA borrowers. It was recognition of this fact that caused our board of directors to bring into being an REA Borrowers Committee, and also caused the holding of this, the first, borrowers conference in conjunction with and as a part of our national convention.

You know what these problems are better than I. One, I know, involves the question of mandatory competitive bidding on equipment purchases, a matter that has been on the agenda of the REA Advisory Committee for at least the last two years. My own views on that subject are known. At least I have given expression to them. Other subjects include the REA minimum accounting requirements, the amount of accounting, engineering and other assistance that borrowers feel they may have a right to look for from the REA headquarters or its field staff. Still another is the red tape that seems to be an inevitable part of any large governmental establishment, however good the intentions of those in ultimate authority may be. And there are still other problems, but I shall undertake to go into only one other.

There are two "splinter" trade association groups which seek support of their organizations on the ground that they are necessary to protect the 2 per cent rate of interest on REA loans. Everyone in this room knows that the present average cost to the government of borrowed money is higher than that by more than 50 per cent. This is a fact of public knowledge. It is also a fact that the United States Congress in its composite judgment decided that it was in the over-all best interest of this country to subsidize partially the provision of telephone service in certain areas. A little more than a decade ago Congress also enacted the Social Security Laws that are now a part of our economy. When enacted these laws were condemned as being socialistic, but they are now accepted as a part of the government's program in the interest of the over-all good.

Congress fixed the present 2 per cent interest rate in the REA act. I can envision little if any likelihood that legislation detrimental to the interests of the farmers of this country will be enacted. Congress is not under concerted attack on this issue, and, speaking as only one individual director of our national association, I foresee no occasion for taking any position on this matter. It is a matter for congressional determination, and only Congress can change it.

If the subject ever became a live and active one, it would be time for our managing body to decide what action, if any, should be taken by the USITA. But in the political climate likely to exist for some time to come, I don't look to see the subject become active.

At such a conference as this, and in the favorable atmosphere provided by the USITA convention, most of the problems that are peculiar to REA borrowers can be made the subject of discussion. There is an old saying that in the open forum of debate, the truth rises to the top.

BROADER SERVICE HORIZONS

Concluded from page 79

ing and delivering information on 8 leads. Such an arrangement is also under study and is referred to as a FOOS *(Four-Out-Of-Sixteen)* system.

I can not give you a precise estimate of the cost of the proposed TOOT subset. However, the designers are shooting for a cost which will permit a sending (outlying) station to be rented for under $5.00 a month. The receiving terminal will include more components than the sending subset and is expected to cost about five times as much. However, this balance of costs (between sending and receiving points) is admirably suited to "data gathering" systems where there are a large number of sending points feeding information into a central data processing center.

Customer contacts in connection with Dataphone trials have indicated a considerable need for this kind of a system—one in which the sending station is very inexpensive. It appears that considerable complexity can be afforded at the central location because one unit there will serve many outlying points.

The provision of very simple low-cost data transmission arrangements (in the $5.00 per month class) will open up a whole new field. I have seen development models of card-reading devices and 10-button keyboard devices which are comparably low-cost. Much of the ordering, status reporting, production recording and similar transmissions which are now by voice will be man-to-machine in the future.

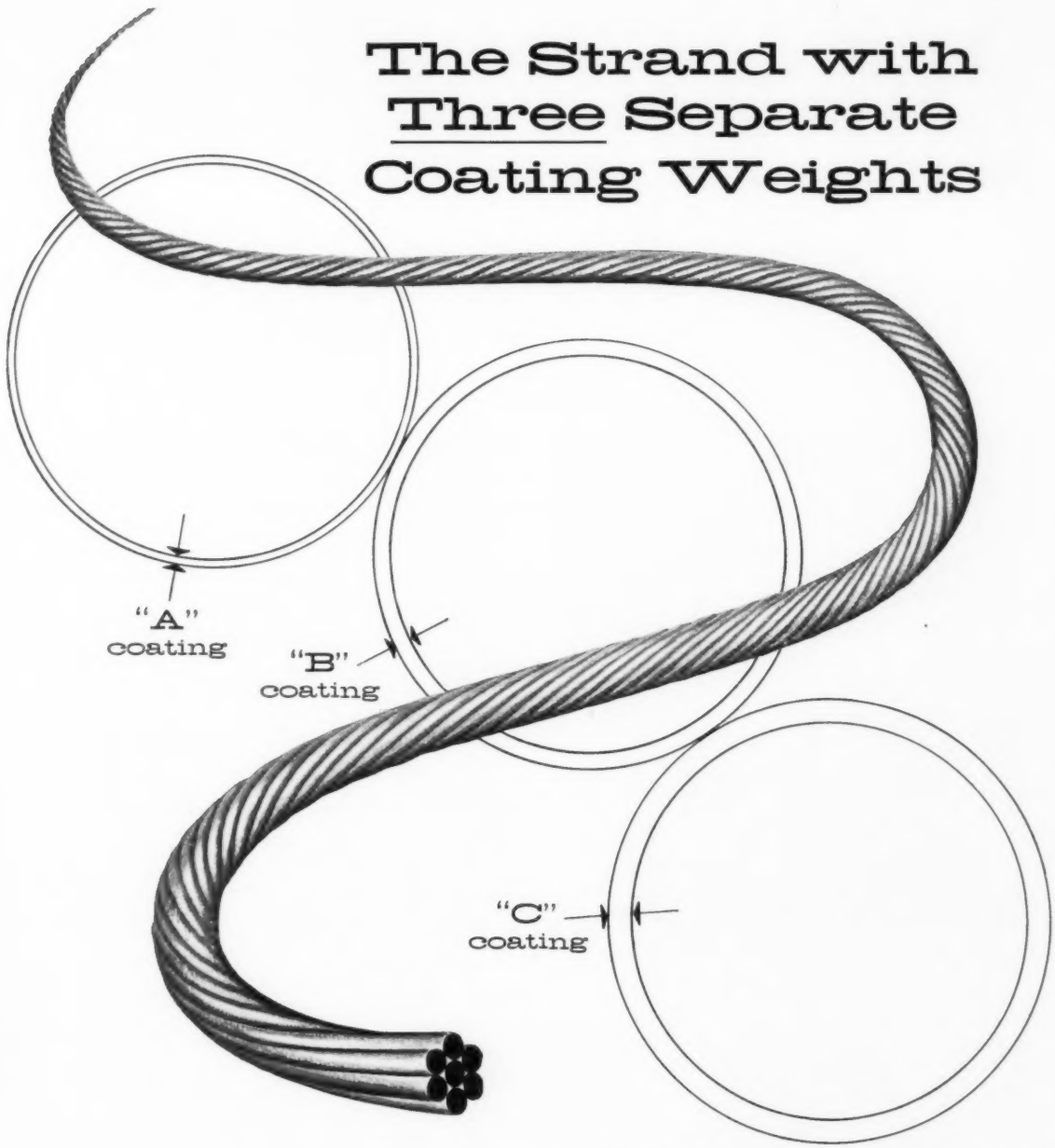
Customers and business machine people have also indicated the need for a subset which is somewhat more sophisticated than the present digital subset—one having a higher bit rate capability. This would be used between locations where very large volumes of data are to be transmitted. Work is continuing in the Bell Laboratories on the exploratory development of such a subset with the objective of obtaining both improved error performance and increased transmission speeds. It is probable that some of the Independent manufacturers and Independent laboratories will contribute towards the solution of these problems just as they have done in so many instances in the past.

The Future

You will recall that at the outset I spoke of how a large industry can not "level off", how it either goes up or it goes down. I further spoke of how, if one can not grow upward, there is still the opportunity to grow outward—to expand the usage of basic facilities. Lest I be misunderstood by someone who might assume that telephone companies' interest in data transmission is solely for the purpose of continued growth, let me hasten to add that I am firmly convinced that data transmission is something which telephone companies could not escape even if they wished to.

I do not believe it would even be possible for us to prevent our customers from transmitting data over our plant. Therefore, I think the problem which faces the telephone industry is not whether we are to transmit data, but how we are to transmit data. May I suggest that the Dataphone concept under which telephone companies provide only a subset—performing a necessary and useful function, as well as protecting the other users of our service—is a most attractive approach. We are just beginning to "scratch the surface" of finding ways to handle the ever expanding data transmission needs that will inevitably accompany the growth of office automation.

The Strand with Three Separate Coating Weights



To meet the full range of field conditions, Bethlehem offers strand with three separate coating weights – A, B, and C. Coating A, the lightest, is equal to extra-galvanized. Coating B is twice as heavy. C, which offers the greatest protection of all, is a triple-weight coating. Thus you can get exactly the right "armor" for each individual installation.

The coatings are made of dependable zinc, which guards the steel wires from corrosion. Whichever weight you choose, the coating will be uniform and ductile, and tightly bonded to the steel.

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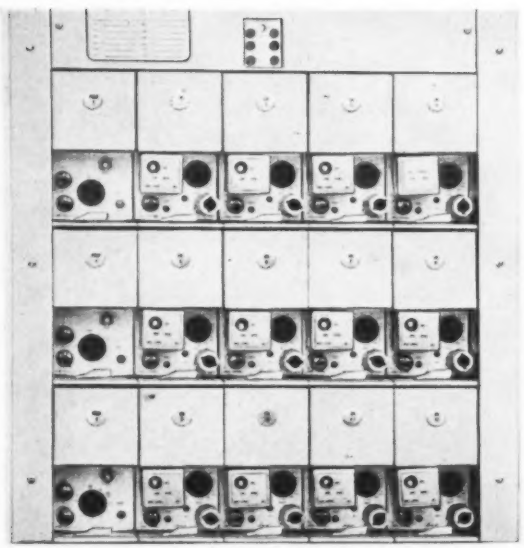
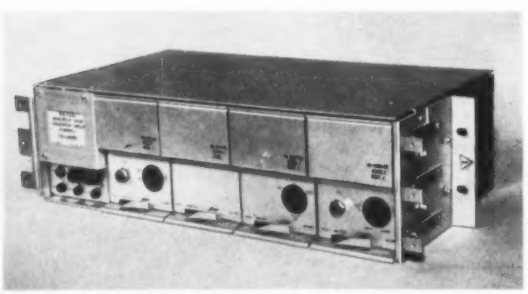


Typical Lenkurt 45-Class Basegroup Channel Bank provides channelizing and grouping equipment for 12 voice channels, yet occupies only 22¾ inches of vertical rack space. Type 45C Carrier provides for economical expansion in 4-channel groups by the simple addition of interchangeable plug-in units.



Lenkurt Basegroup Transfer-Converter permits transfer of 12-channel groups between Lenkurt 45-Class systems and Western Electric J, K, L, or CCITT conforming systems. It eliminates expense of extra channelizing equipment—permits different carrier systems to be connected in tandem without demodulating the individual carrier channels to voice frequency.

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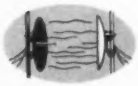
New Lenkurt Microtel Type 74A

Lenkurt's new Type 74A Microtel for the 6000 mc band is the latest, most advanced microwave equipment on the market. Utilizing miniaturized plug-in components similar to those in Lenkurt 45-class Carrier equipment, it offers extreme flexibility—meets expansion needs from as few as four channels to high-density intercity systems.

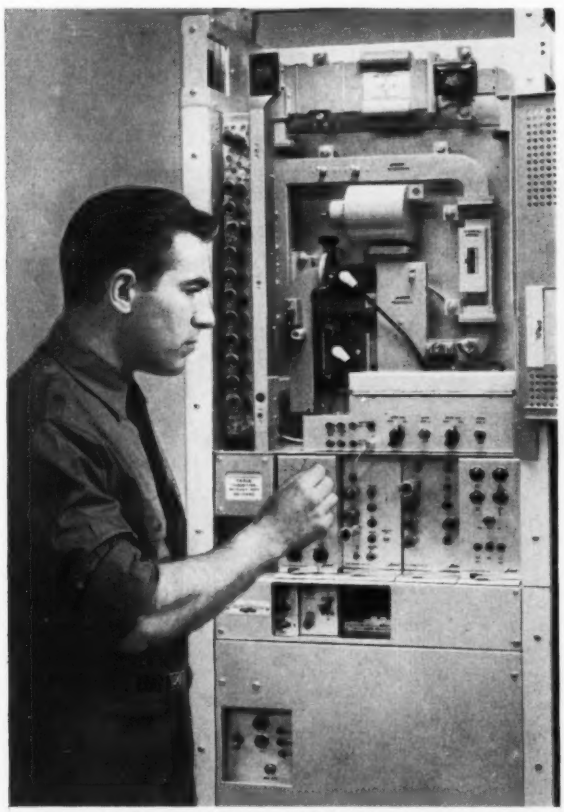
Automatic Electric offers you Lenkurt Carrier and Microtel in a complete package—*engineered, furnished and installed*. If you want, we'll do the surveying—erect microwave towers—take complete responsibility for a "turn-key" installation, including on-the-job and factory training of your people. May we send you more information?

toll revenues!


open wire

or cable

at carrier frequencies!



Lenkurt Microtel Type 74A takes less floor space—requires smaller antennas—uses fewer tubes—consumes less power! A single terminal can accommodate 4 to 240 channels; system can be expanded to 960 voice channels, plus 64 supervisory, remote-control or telemetering channels, *without additional antenna equipment.*

Rigid Quality Control—Three of more than 150 quality control stations at the Lenkurt Factory. These stations perform a 100% inspection of master oscillator units, regulators and power supplies for 45-Class Carrier systems. Highest standards of precision manufacture and inspection at every step mean lowest costs over the years.

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ENGINEERING—A NECESSARY EVIL?

Continued from page 64

ignored by some companies' management. It is this phase of the engineer's task, incidentally, with which the USITA course at Michigan State University has been concerned in an effort to create an awareness of and an ability to cope with such aspects of the engineering job.

In the engineering department of the larger operating companies, this engineering responsibility rests in the plant extension section. Because it is so important that we all be aware of the plant extension functions, even though in a small company the general manager may have to cover them "in his spare time," let's look at them in a little more detail. The plant extension functions are three major ones, as follows:

(1) A long-range planning function exists to keep abreast of new developments in the telephone art and the application of these developments, which offer improvements in service and further economy of operation.

Long-range studies must be conducted to determine the best methods for the orderly and economical extension of plant. Studies include such items as fundamental local exchange plans, fundamental toll centering arrangements, and general conduit plans, where such are applicable.

Economic selection studies of alternative plans are undertaken to determine the most desirable means for the construction of large items of plant, such as buildings, central office equipment, major cables and conduit. Essential study data are assembled from the operating departments, such as traffic and commercial, and from the engineering department sources to assure proper consideration of all views and coordination of all requirements.

These long-range plans are concerned with the general trends rather than with daily crises. The engineers doing this work try dispassionately to determine the exact nature of the future telephone systems, to find the relationship of the separate items, to foresee problems and formulate plans on a long-term basis; in general, to bring the picture into proper perspective.

This planning is not in the nature of pre-engineering the details; rather it is making an orderly arrangement of the necessary major steps to accomplish some clearly understood objective. Steps are major in the sense that they are costly or complex and require extensive coordination and planning. Such planning should be early enough in time and specific enough in term to be effective as a guide, and broad enough to permit intelligent application.

(2) Another function of plant extension work is that of developing current plans to indicate the way in which scheduled plant additions and re-arrangements shall be made, so that the fundamental plan will be reached in the most desirable and economical manner. By coordinating the short-term plans with the studied results of the long-term plans, we are able to make the right decisions and avoid, under the pressures of immediate conditions, the expedient that may be the easy way, but not the best solution to a problem. Expediency may look like a big strong fellow when you call on him today, but you'll find that he is a weakling when you try to lean on him tomorrow. When long-range planning dominates your decisions today, tomorrow's decisions will take care of themselves.

(3) Finally, there is the construction budget responsibility. While this responsibility may be less formally in existence in the smaller companies, it nevertheless must exist. The construction program together with its periodic revisions is prepared by correlation of estimates submitted by the engineers charged with a specific responsibility.

Plant Extension work includes the maintenance of schedules and analyses required for supervision of the construction program. Current specific orders prepared for authorization of projects are reviewed to assure coordination with the construction program and with general plans previously de-

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termined. Special studies are made of the effect of the construction program on plant investment in operations.

And, by way of summary, let's answer our quizzical title, "Yes and no." Yes, the telephone engineer's job becomes increasingly necessary as fixed plant investment more and more replaces the high expense of manual operation. Thus, the expense of labor which may be varied in accordance with the business cycle is, to an ever-increasing extent, replaced by the fixed charges of the labor-saving plant investment. No, engineering is not an evil, because good engineering doesn't cost; it pays.

REDUCING HIGHWAY COSTS

Continued from page 71

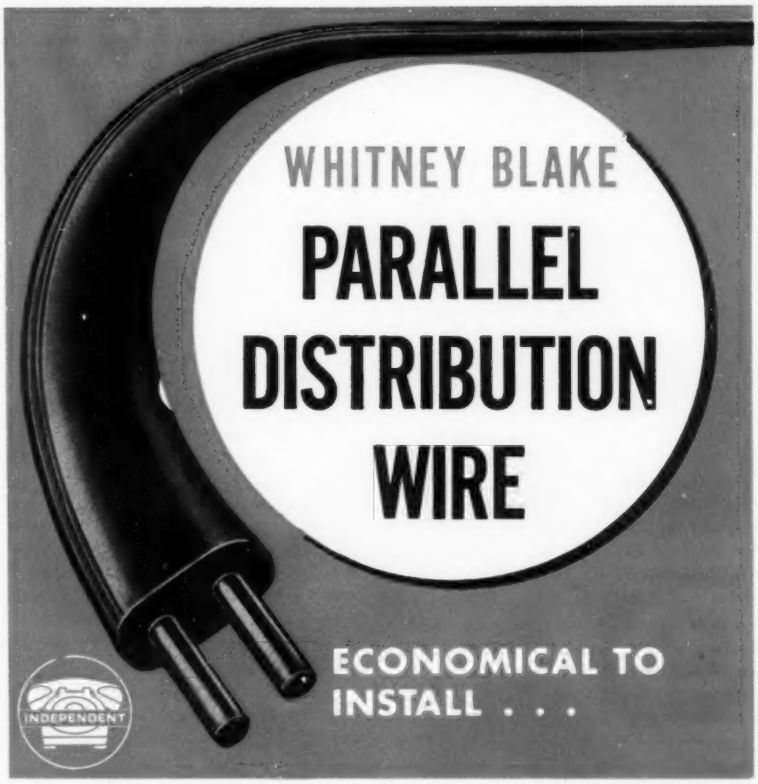
to effectively accomplish a job on the part of the utility and the state alike is possible.

This discussion was entitled "Reducing Federal Highway Plant Relocation Costs." I have deliberately said nothing about the controversial question of reimbursement for federal highway relocations. My purpose has been accomplished if you now go home with one single idea—to save money by developing the best possible liaison between your company and the governmental bureaus responsible for the federal highway program in your community.

Telephone people are rugged individualists. Our operations have frequently been brought up by the efforts of one man or one family. Our rugged, individualistic, owner-operator frequently operates without the benefit of the specialty personnel such as right of way agents or outside plant cost accountants. All of this information must be carried under our hats.

I know one such man who operates a telephone company with 80 miles of pole line in the Sierra-Nevada Mountains of California. He can tell you how many woodpecker holes there are on the top of the 39th pole out from the central office and he can tell you what size pipe was used in the underground crossing at Five Corners out on the state highway. It is even true that despite the fact that the underground dip has been present beneath the state highway for the past 15 years it is not recorded in any files other than the memory of our utility manager. And it is probable that our utility manager considers that he has plenty to do without going to the state capitol or even the county seat to discover what plans there may be for highway relocation two or three years from now in his community.

We have news for the telephone man. He must face the new facts—if he is



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going to reduce his costs of highway relocation he must dial "information" and find out what is going on. If he does not have the time to become inquisitive, then his state telephone association secretary must assume the job. Somebody has to be "in the know." Let us go home from Chicago and find out what's going on in our own communities in regard to highway relocation.

REGULATION AND ACCOUNTING

Continued from page 50

correlation of regulated accounting to the functions of regulation — particularly to the functions of regulation which have a bearing on the financial affairs of public utilities.

In California, in the matter of security issues, for example, if we pause to consider, we can easily evaluate the advantage of regulated or uniform accounting as a faculty for expediting regulatory audit, and consequently for expediting the regulatory decision on an application for authorization to issue securities.

In California, the account form and content requirements for such capital accounts as capital stock, capital stock expense, capital stock discount, and capital stock premium, for bonds, bond issuance and discount expense, and bond premiums, to name a few, are required of public utilities in greater elaboration than are the demands of the California corporation code, for example, upon the non-utility corporations. This elaboration of detail in the instance of recorded entry, obviating to some degree and necessity for analysis, certainly affords economy of time required for audit.

Again, uniformity of other balance sheet asset and liability accounts, and of the income statement accounts, affords readier determination of financial ratios, the relationship of revenues to investment, and other financial yardsticks with which you are familiar, and of periodic and intra-industry comparisons of these data.

Every one here, of course, is familiar with the major problem of rate adjustment, which confronted every regulatory body or office as well as every public utility for the past 10 or 12 years. This problem has been extreme concern in California where the effects of inflation have been compounded by extraordinary growths of population.

It is not difficult to evaluate the virtues of regulated accounting as an important aid to the requisite commission staff activities. The staff must prepare operational and investment studies, for presentation in these rate cases, which set forth not only the facts contained in the applicant's records, but also contain estimates of plant investment and operations based upon these recorded facts and projected into the future. If prescribed accounting was not in force, the task would be much greater. And, again, in rate proceedings, as in the instance of security issues, comparisons within an industry, if need be, are afforded by account standardization.

It is needless to indulge in conjecture as to what additional delays might arise—what the rate hearing backlog might be—by reason of lack of regulated accounts. As an example, I have in mind the case of a utility, different in character from telephone, operating individually in some 20 districts in California, with centralized capitalization and management, which is now in the motions of processing its 50th rate application since 1946.

In back of rate regulation, of course, is the factor of rate base. We are all familiar with the historical development of pricing methods in this field of contention—with the theories of reproduction cost, of current market value, and of original cost when first dedicated to public use.

Regardless of the pricing methods of the day, regulated account classification affords orderly access to the various categories of plant; accelerating not only the study of the constituency of plant accounts, but also facilitating the determination of related depreciation. And, again, account standardization permits intra-industry comparison.

Before concluding, let us turn our attention for a moment to the subject of operational studies. The contribution which regulated or standardized accounts afford management for the purposes of promoting business, for controlling expenses, for efficiency studies, and for periodic and industry comparisons of these data, again is obvious.

In summarizing the discussion to this point, I believe we can all concede — members of the utility industry as well as regulatory commission representatives—that regulated accounting contributes importantly toward facility in compliance with regulation as well as facility in the administration of regulatory rules and laws, for the benefit of utility customers, and hence, for the benefit of the public utilities.

I would like to conclude this presentation with a discussion of two accounting problems which seem to have reached considerable importance in recent years, at least in California. The two problems are:

(1) Amount to be capitalized as overhead.

(2) Dissemination of information relative to interpretations of instructions contained in systems of accounts.

The first problem, or the amount to be capitalized as overhead, has become an item of major importance in California in recent years, due to the abnormal amount of construction required to meet the demand for service. This is a problem with which many of the telephone companies are concerned and it results, in part at least, from the fact that the prescribed system of accounts appears to require the capitalization of a certain amount of administrative changes.

In applying this instruction to their accounting practices, most telephone companies have adopted a procedure which, when applied in a year of abnormal construction, causes operating expenses to be reduced below what might be considered normal. If such a recorded year is used for rate-making purposes and no adjustment is made for the abnormal amount of overheads capitalized, a company could conceivably be granted rates which would produce inadequate revenues in a normal year.

To overcome this problem, it might be advisable for telephone companies to give consideration to the adoption of accounting procedures which would provide for the capitalization of only that portion of the administrative costs which might be considered as incremental costs associated with construction. Under such a plan or procedure, operating expenses would contain the amount of administrative costs which might reasonably be expected to be incurred from year to year on a normal basis without being unduly affected by the volume of construction in any one year.

The second problem to which I have referred, or the dissemination of information on accounting interpretations, is one which you in the telephone industry might help to solve. As you all realize, the printed instruction contained in the system of accounts cannot possibly cover all contingencies, or supply an answer to all the questions which may arise, and as a result, various interpretations are given to the instructions.

We on the California commission staff from time to time receive inquiries and attempt to answer all questions on a consistent basis, but necessarily our answers must reflect our interpreta-

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tions. We do have access to the accounting interpretations issued by the NARUC Committee on Accounts and Statistics, as I am a member of that committee, but these interpretations usually cover abnormal situations that would not provide an answer to the day-to-day questions which arise in the minds of telephone company accountants.

It is not the truly abnormal question with which I am concerned, but the day-to-day problem which the telephone company accountant encounters and which might be solved through the establishment of a central clearing house within the telephone industry. I feel quite sure that the various commissions concerned in telephone regulation would participate in such an undertaking, and it is quite possible that the establishment of such a clearing center within the telephone industry would tend to reduce erroneous accounting, which results from a misinterpretation of instructions, when applied to transactions not previously encountered.

In bringing this problem before you, I do so because it seems that utility accountants generally, seem very reluctant to call upon the regulatory agency for an interpretation of the accounting instructions, whereas it is quite possible they may call upon members of their own industry if such a clearing center were established. It is quite possible also that a clearing center could issue accounting bulletins from time to time which would be of great help to the industry generally as well as to the regulatory agency.

REPORT OF USITA EXECUTIVE VICE PRESIDENT

Continued from page 33

They agreed that Congress should be asked to enact legislation permitting the states to get up to 40 per cent of the present revenue which the federal government collects from the 10 per cent tax on local telephone calls. . . .

On Sept. 8 of the present year the Federal-State Action Committee at a meeting decided to modify its proposal to 3 per cent of the federal tax of 10 per cent and to authorize the treasury to distribute the revenue equivalent of an additional 1 per cent to the poorer states.

If the plan goes through we may as well reconcile ourselves to having the telephone excise tax with us for all time to come. It seems to me that our industry must resist it with might and main. . . .

If a bill is presented at a subsequent session, it is inconceivable to me that a proposal representing such a radical departure from normal tax procedures would be seriously considered without comprehensive hearings by the House Ways and Means Committee and the Senate Finance Committee at which representatives of the telephone industry and the telephone using public are given an opportunity to express their views.

The proposed plan is unwise, unsound, unworkable.

Internal revenue collections of communications excise taxes for the fiscal year ended June 30, 1957 amounted to $613,209,000, broken down as follows:

Long distance telephone, telegraph, cable radio, etc...	$244,251,000
Leased wires	21,934,000
Local telephone service....	347,024,000
	$613,209,000

(b) *Noteworthy Changes Made by Technical Tax Revision Bill.* A voluminous measure called the Technical Tax Revision Bill, H.R. 8381, making a myriad of technical changes in the tax code was acted upon at the last session by the House in June and the Senate in August. Perhaps of primary interest to telephone companies were changes in terminology of various communication services. The bill—

(1) Redesignated "local telephone service" as "general telephone service."

(2) Redesignated "long distance" telephone service as "toll telephone service."

(3) Retained "telegraph service" without change.

(4) Redesignated "leased wire, teletypewriter or talking circuits special service" as "teletypewriter exchange service" and "wire mileage service."

(5) Retained "wire and equipment service."

The bill also made the following minor changes in communication taxes:

(1) Installation charges were removed from the base of wire mileage tax (leased wire tax under present law) and the wire and equipment service tax. Such charges are already excluded from the base in the case of general telephone service tax and presently are not a factor in the case of the toll telephone and telegraph service taxes.

(2) Terminal facilities were excluded from the base of the wire mileage tax.

(3) Interior communications systems were excluded from the base of the wire mileage and the wire and equipment service tax. Such systems are those in which the service is rendered through the use of equipment solely on the premises of the subscriber.

(4) The exemption for common carriers, telephone and telegraph companies, and radio broadcasting stations and networks was made inapplicable in the case of the tax on teletypewriter exchange service.

All of these changes are to become effective Jan. 1, 1959. A committee report on the bill in question stated that the changes would result in an annual revenue loss to the government of $2.5 million. . . .

(c) *Bills Relating to the REA.* In the President's budget message to Congress early in the last session he said that approximately one-half of REA electric power now goes to rural industrial and non-farm residential consumers and that these non-farm users will account for a large share of the increasing demands in the future. In view of this the President stated the administration would be prepared to assist both electric and telephone borrowers to obtain financing from private sources where the security is adequate, "and the loans could be paid within a reasonable time."

The purpose was to shift the burden of REA loans from the government to private sources. It contemplated a revolving fund with the Secretary of Agriculture as managing trustee. The fund would include congressional appropriations made available to the REA, amounts repaid by borrowers, and funds raised through the sale of revenue bonds. Issuance of revenue bonds up to 50 per cent of the assets of the revolving fund would be authorized.

Under the plan the present statutory 2 per cent interest rate would apply only to loans made from funds provided by Congress. Other loans at higher rates of interest might be made by the secretary if he felt the circumstances of a particular loan application warranted a higher rate. In addition to a revolving fund, the proposed legislation contemplated government insurance of loans obtained from private sources. It recommended an appropriation of 1 million dollars to protect private lenders against all losses. The interest rate on such loans would have to be approved by the Secretary of the Treasury, and the amount of loans guaranteed by the government would be limited to 150 million dollars in the first year of operation of the new plan.

No congressional sponsor of this proposal was found and hence it did not find reflection in any bill introduced.

Bills were introduced in the 85th Congress to increase the interest rate on REA and other government loans but did not reach the hearing stage.

At the last session Congressman Walt Horan (R., Wash.) introduced H.J.Res. 492 calling for the appoint-

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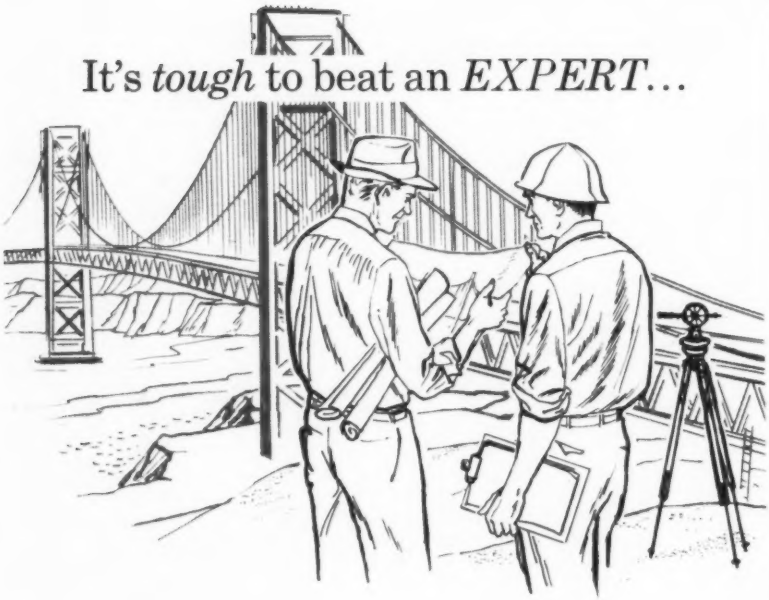

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ment of a 12-man commission to study the REA lending program and report not later than Mar. 30, 1959. . . .

The measures referred to made no legislative headway and will have to be reintroduced at the next session if they are to be pressed for consideration.

(d) *Bill to Increase Securities Exemption.* In the first session of the 85th Congress the Senate passed S.2299 calling, among other things, for an increase to $500,000 in the present $300,000 securities exemption under the Securities Act. At Senate Banking and Currency sub-committee hearings, our association made formal appearance and presented a statement in support of the increase. . . .

After Senate passage the bill went to the House where it was referred to the Interstate and Foreign Commerce Committee. This committee was so deeply engrossed in a quarter of a million dollar investigation of the FCC and other federal regulatory agencies, that it failed to reach the bill before adjournment. All of the work that was devoted to this matter will have to be repeated next year.

(e) *Highway Reimbursement Provisions.* The facility relocation cost provisions of the 1956 Federal Aid Highway Act were attacked in Congress early in the last session. It stemmed largely from a recommendation by Secretary of Commerce Weeks when appearing before a sub-committee of the Senate Committee on Public Works. The secretary recommended not only that the reimbursement provisions be eliminated but that for reasons of safety utilities should be required to get off the highways except where permission may expressly be given. This came as a shock to all affected utilities including telephone companies.

It was Senator Case (R., S. D.) who later in the session led the floor fight to water down the reimbursement provisions by reducing to 70 per cent (from 90 per cent) the reimbursable amount, limiting the reimbursement to states which under local law are "required" to reimburse (as distinguished from being permitted), and exempting from reimbursement altogether removal costs on highway projects already begun.

This serious emasculation was averted by a roll call vote of 47 noes to 38 ayes. A switch of five votes would have been fatal.

In 1957, Congressman Robert E. Jones of Alabama introduced two bills to sabotage the provisions not with serious thought they would be passed but rather to embarrass efforts at the local level to obtain needed implementing state legislation.

Mr. Jones will probably resubmit

his bills at the next session of Congress. The circumstances point to the desirability of maintaining as close liaison as possible with the several state highway commissions in the hope that ultimately they may adopt a more enlightened view of the reasons which underlie the reimbursement principle....

(f) *The Switchboard Operator Exemption.* The switchboard operator exemption is still a part of the Wage-Hour Act. But the base from which attacks have been made in more recent years has been broadened. In addition to meeting the onslaughts of the unions we have also had to resist demands from the administration. The platforms of both major political parties have favored expansion of coverage of the law. . . .

The Wage-Hour Act was enacted 20 years ago, in 1938. The 500-station exchange switchboard operator exemption came into being a year later following many weeks of the hardest kind of work in Washington by John Agee, Cap Henry, Gus Lane, Redge Phillips, Ed Blomeyer, B. L. Fisher, Jack O'Connell and other persons. In 1949, the exemption was boosted to 750-station exchanges after much additional work by our Employment Relations Committee and your association officers. These legislative victories in 1939 and 1949 serve as truly magnificent testimonials to what can be accomplished through united effort and devoted labor. They have kept many a small Independent telephone company alive. . . .

In his State of the Union message to Congress in 1956 and again this year, President Eisenhower requested Congress to broaden the coverage, and he pledged the "full resources of the executive branch to assist the Congress in finding ways to attain this goal."

Chairman Kennedy of the Senate Labor Sub-committee last year introduced S.1853 to rewrite much of the Fair Labor Standards Act and wipe out entirely or water down severely various exemptions. As to ours, his bill would limit the exemption to operators operating a switchboard in their homes. To this plan we registered definite and detailed objections. . . .

What the Independent industry needs is a little more time to work out its small exchange problem. At the present rate of mechanization, conversion to dial operation will be completed in nine or 10 years. Repeal or watering down of our exemption in the meantime would still jeopardize the existence of many small Independent companies. It would also be harmful to many of the small units of our multi-exchange operations.

(g) *Community Facilities Bill.* An-

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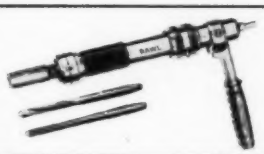

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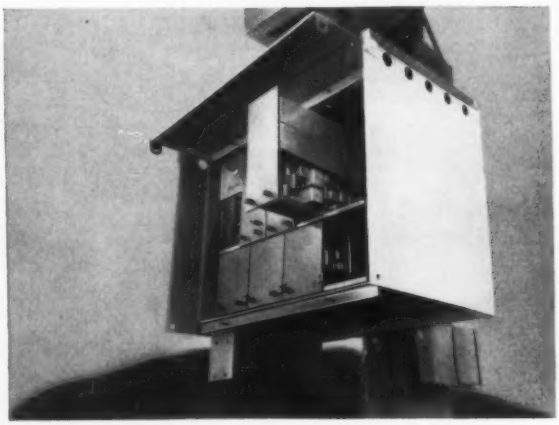

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other illustration of the need for watching legislative proposals carefully is to be found in the Community Facilities Bill, S.3497, which when it passed the Senate on Apr. 16 called for an appropriation of 1 billion dollars. When reported by the House Banking and Currency Committee the bill called for 2 billion dollars. The money was to be used through the Housing and Home Finance Agency to make loans to municipalities to build community facilities and public works, *including utility facilities.* In a declaration of policy, it was stated that it is the policy of the Congress to assist municipalities and other political subdivisions in providing essential public works and public facilities to enhance the health and welfare of the people. The U. S. Chamber of Commerce called it another handout. . . .

In section 202 (a) (6) as reported to the House on June 6 there was a prohibition against financial assistance with respect to any public facility "which would compete with an existing privately owned public utility rendering service to the public at rates or charges subject to regulation by a state regulatory body, unless the state regulatory body determines that in the area to be served . . . there is need for an increase in such service . . . which the existing utility is not able to meet. . . ."

That exception clause was good as far as it went, but it would have provided no safeguard in Iowa and Texas which have no state regulatory bodies. The USITA undertook to give some attention to this matter.

Fortunately the House by roll call vote on Aug. 1 turned its back on an application for a rule to bring the measure to the floor for debate, by vote of 187 Nays to 173 Yeas. But for that happy ending, municipal ownership of telephone or other utility operation might have gotten a foothold in the two states mentioned which do not have regulation, as well as in other states if the regulatory bodies made the factual findings described above.

(h) *The Area Redevelopment Act.* Although the House refused to take up the Community Facilities Bill above mentioned, it did pass the Area Redevelopment Act S.3683. Under the terms of this bill, loans and outright grants together with technical assistance in "industrial" and "rural areas" throughout the country could be made where unemployment conditions prevail. . . .

An industrial redevelopment area is one where there has existed substantial and persistent unemployment ranging from 6 per cent to 12 per cent over specified periods of time extending from

six to 24 months. Rural redevelopment areas are those where there exist the largest number and percentage of low income families and a condition of substantial and persistent unemployment and underemployment.

The most important provision in the bill of interest to telephone companies and other utilities was one authorizing grants to any state or political subdivision to bring utility facilities into being. A provision inserted by the House required clearance, however, by a state regulatory body before such a grant may be made. The provision reads:

"Sec. 7(e) No financial assistance shall be extended under this section with respect to any public facility which would compete with an existing privately owned public utility rendering a service to the public at rates or charges subject to regulation by a State regulatory body, unless the State regulatory body determines that in the area to be served by the public facility for which the financial assistance is to be extended there is a need for an increase in such service which the existing public utility is not able to meet. . . .

In two states, however, Iowa and Texas, where there are no state regulatory bodies, grants for the purposes described would have been possible without first obtaining state permission. And, even in states where there are state regulatory authorities diligence on the part of telephone companies and other utilities would have been necessary to make sure any action by the regulating authorities was an enlightened and realistic one.

President Eisenhower vetoed this bill on Sept. 6. While both the Community Facilities Bill and the Area Redevelopment Act were, each in a different way, buried for 1958, their sponsors will doubtless seek to disinter them when Congress reconvenes.

(i) *Kennedy-Ives Bill Killed.* After the startling disclosures of the McClellan Committee respecting racketeering in labor unions, the American people had a right to expect some forthright and conclusive action by Congress to control union activities. Instead of such action there was disappointment.

In June, the Senate passed the Kennedy-Ives bill, S.3974, having the stated purpose of protecting union members against wrongful practices, as well as making various changes in the Taft-Hartley Act. When the bill was sent to the House, Speaker Rayburn held it on his desk for more than 40 days.

In that period, a number of "sleepers" in this measure were discovered. It was found that some of the provisions if

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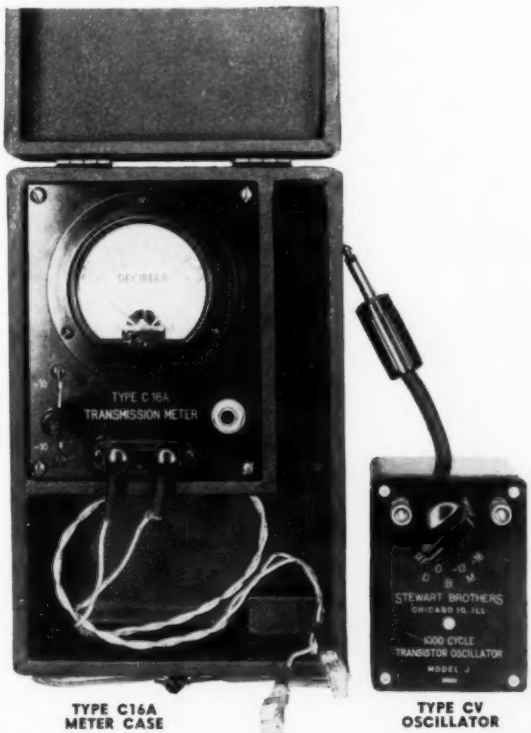

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enacted into law would make it a crime for an employer to try, in almost any way, to influence the decision of his employes in labor matters. Tying the employer's hands would give the unions a large advantage when trying to organize employes. The employer's right to free speech would be affected by imposing a criminal penalty for failure to file a detailed report of *all* expenditures that affect or influence his employes. This language would include expenditures even for publications and letters. There were also objectionable provisions relating to picketing and other matters. . . .

Although hearings had not been held by the House Labor Committee, Democratic Majority Leader McCormack on Aug. 18 asked the House to suspend its rules and take emergency action on the bill. For this purpose a two-thirds vote was required. The House voted against that kind of procedure by vote of 198 Noes to 190 Yeas. Thus not even a majority of the House was willing to jump through the hoop.

The evils and excesses brought out in testimony before the McClellan Committee will have to be tolerated another year before Congress has a further opportunity to pass acceptable remedial legislation. . . .

(j) *Proposed Reimposition of Excess Profits Tax.* Late in the last session a bill, S.4239, was introduced to reimpose the Excess Profits Tax Act of 1950. Its author, Senator Neuberger of Oregon, in a Senate floor speech on Aug. 6 pointed to an expected federal deficit of 15 billion dollars and said that as long as inflationary pressures in the economy can be traced to defense needs, an excess profits tax is a necessary concomitant to any measure contemplating economic controls on prices and wages. . . .

(k) *Proposed Standby Economic Controls.* Simultaneously Senator Neuberger also proposed, in S.4238, standby economic controls of a character substantially similar to those which had been proposed in a 1953 bill introduced by a bi-partisan group of eleven Senators headed by Senator Capehart (R., Ind.). That measure was given a favorable report by the Senate Banking and Currency Committee five years ago.

The Neuberger bill would authorize the introduction of rent, price and wage controls in the event of war or whenever the President on the basis of prescribed studies finds that inflationary pressures threaten the nation's economic stability or whenever Congress declares a grave national emergency. . . .

If such legislation is to receive serious attention it should carry provisions exempting from the freeze the rates

of telephone companies and other regulated utilities, as previous economic controls did. Telephone companies and other utilities are already regulated enough by existing state and federal authorities. . . .

(i) *The Tax Reduction Outlook.* Congress works in a mysterious way its wonders to perform. . . .

In an election year the major political parties compete with each other in an almost profligate manner to see which can do more for the people, with everyone seemingly oblivious of the fact that government can't give anything away without first taking it from someone. The federal spendthrift policies made it necessary at the end of the recent session to increase the national debt limit to 288 billion dollars through next June 30 and 283 billion dollars on a permanent basis. The latter figure is 8 billion dollars above the ceiling that existed before. . . .

Nothing in the history of our country during the past quarter of a century has been more striking than the claimed inability of both Democratic and Republican administrations to retrench in governmental expenditures. With tenacity each year leaders of both political parties hold to the theme that tax reduction is not feasible. It is a record that has been played over and over again. Bob Hope said recently that the federal budget is likely to hit the moon before a rocket does. . . .

The 52 per cent corporate income tax takes more out of each corporation than is left for the owners. The 1,000 bills relating to taxes introduced in the recent Congress were an eloquent expression of the wide-spread dissatisfaction and discontent of the American people with the present tax system in the United States. . . .

The end is not in sight. Even before the sputniks arrived, President Eisenhower in his inaugural address on Jan. 21, 1957, charted a course for continued foreign outlays. He said:

"We recognize and accept our own deep involvement in the destiny of man everywhere . . . And beyond this general resolve, we are called upon to act a responsible role in the world's greatest concerns and conflicts—whether they touch upon the affairs of a vast region, the fate of an island in the Pacific, or the use of a canal in the Middle East."

The President said we must be prepared to use "our substance to help others rise from misery, however far the sound of suffering may be from our shores." Before adjourning on Aug. 23, 1958, Congress appropriated 3.2 billion dollars more for foreign aid. In his recent book Eugene W. Castle said that

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per fastener	1	3½	71	½	4	83
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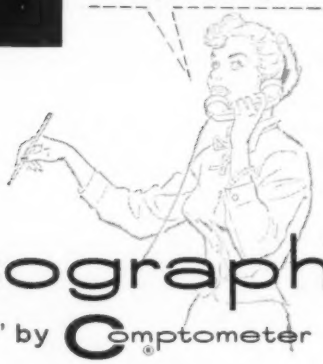

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He would be bold indeed who would venture a prediction as to when there might be an amelioration of a tax burden which is becoming more and more crushing with each passing year. Certainly it will not come about until there is a congressional will to curtail governmental expenditures at all levels and for all purposes; and that will not come about until the American people make their wishes known in terms at once firm and certain. . . .

Citizens' Responsibility

The revelations of the McClellan labor racket committee on pay-offs, unlawful picketing, boycotts, arson, union strong arm methods, the improper use of union funds and the arrogance of labor leaders are certainly enough to make one more than skeptical. Skeptical of the efficacy of the American educational system and religious training, skeptical of law enforcement, skeptical of legislative processes, skeptical of the willingness of American businessmen to do something about it.

In far too many instances there has been apostasy from moral rectitude. . . .

The draining off by government through the process of tax laws of the rewards of human effort has long sapped at the roots of initiative and incentive.

The growing development of a welfare state in which more and more people look to a benevolent Uncle Sam to bail them out is a token of the times. More and more pleas assail the ears of Congress each year for spending more and more money on more and more things. . . .

Government is getting bigger and bigger. We seem to ignore a warning by a statesman of old that government always tends to become a conspiracy against liberty. Even back in the days of Jefferson, when life was a good bit more simple than it is today, the sage of Monticello said: "We have more machinery of government than is necessary, too many parasites living on the labor of the industrious."

There must be a reawakening. Idealism is not worth much unless it is put into practical effect. A special obligation rests upon businessmen. They are on the firing line. Daily they see evidence of the moral defalcation of labor. They are witnesses to the inroads of government in almost every avenue of human effort. We are all familiar with the lines:

"Vice is a monster of so frightful mien
As to be hated needs but to be seen;

But seen too oft—familiar with her face,
We first endure, then pity, then embrace."

Businessmen have been successful in selling goods and services. They have not always been successful in selling good government. They must make a greater effort. There are some important elections coming up this fall, for national office as well as state office. Laying their plans well in advance of the day at the polls, more businessmen must begin practising citizenship with vigorous action, not merely talking about it.

Citizenship involves action as well as beliefs.

The well-known news commentator, Raymond Moley, at his own expense has printed a pamphlet entitled "Political Responsibility" in which in an inspiring manner he points to the need for a reawakening of political responsibility on the part of everyone but especially businessmen. . . .

Telephone people have traditionally been in the forefront of community activity. I am confident that in November they will want to acquit their responsibilities as citizens and exercise a potent influence in the selection of those who make our laws and those who administer them. . . .

Industry Journals

Our industry journals, sometimes referred to as the trade press, have continued to be effective in the dissemination of pertinent articles, operating data and other information of interest to Independent telephone companies. To the editors of TELEPHONY and Telephone Engineer I want to express appreciation for an important job well done. The industry has many reasons for feeling grateful to those who so ably edit these publications.

Perhaps one of the principal reasons for the success of the journals is not alone the comprehensive coverage of telephone news that is provided, but the independence of judgment reflected in their general editorial content. They are not the mouthpiece of the USITA or of any company or group, operating or manufacturing.

Over the years these splendid publications have cooperated with our association and the industry in many ways. This does not mean their editorial policies have always harmonized with the views of our association. There have been differences of viewpoint at times and may be differences hereafter. This is their right, and ours. What it does mean is that the industry has had the benefit of these public media of news and views, sympathetically presented whenever possible and when not

how to get FCC licenses for your technicians

(without sending them to school)

The greatly increased use of mobile communications and microwave relay systems by the telephone industry is creating a serious problem . . . how to get FCC licensed technicians.

Your company has a staff of technicians. They know and understand telephone work, but do they have an FCC license? Do they thoroughly understand electronic fundamentals?

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sympathetically, then certainly constructively. . . .

I shall now bring the report to a close. But before doing so I would like to mention, in language I used several years ago, some of the things that must engage our attention in the period that lies ahead:

(1) We must continue as a cohesive, coordinated industry when common problems arise so that by concerted effort, a pulling together, combined wisdom and strength may be brought to bear in providing satisfactory solutions.

(2) We must not lose sight of the fact that into the hands of telephone management have been entrusted the savings of the investor and that our position of trusteeship calls for never-ending vigilance to see that the interests of the one indispensable man in a free economy receive adequate recognition.

(3) We must open up more and more avenues of financing so that ever increasing demands for telephone service may be met.

(4) We must take advantage of the most advanced means of improving and extending our service, acting with boldness in accepting new technologies.

(5) We must be careful to train men and women to take their place in the management, supervisory, technical and other branches of our business.

(6) We must continue to be diligent on the legislative front in order to make certain on the one hand that harmful legislation is defeated and on the other hand that meritorious legislation may have a chance of enactment.

(7) We must continue to be alert to detect regulatory and other governmental trends in order to be in a position to support the good and call attention to the bad.

(8) We must continue to conduct an aggressive merchandising campaign, bearing in mind that so far the industry has barely touched the surface of American use of the telephone notwithstanding the greatest saturation in the world.

(9) We must ever remember that we are engaged not only in an essential calling but one impressed with a public use and hence subject to the high standards of public regulation.

(10) We must continue to provide dynamic and enlightened leadership so that as an industry we may acquit the public service obligations resting upon us.

In giving attention to all of these, we have a right to look to the USITA for guidance, inspiration and leadership.

Classical Liberalism Lives

"Classical liberalism, long quiescent in America, is beginning to undergo a resurgence among thinking scholars. . . . We are coming increasingly to realize that economic freedom is less important as an end in itself than as a necessary, but not sufficient, condition for political freedom"—ARTHUR KEMP, *Professor of money and credit, Claremont Men's College.*

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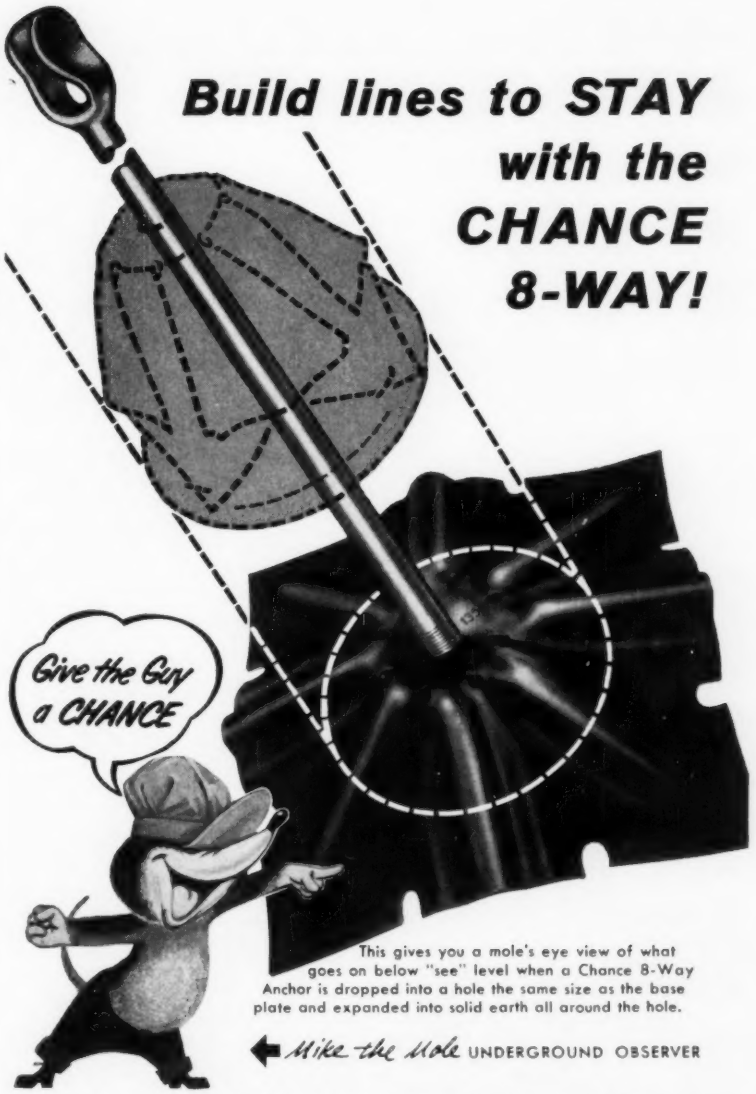
TOLL SETTLEMENTS

Continued from page 35

individually. The toll engineer, as a member of the Washington staff, has the advantage of the expert assistance of the executive vice president and his staff, all of whom contribute in their various fields to the study of the extremely broad subject of toll settlements which covers every phase of Independent telephone company operations. The expense of the work on these toll settlements uses many of the dollars provided by your membership dues. The studies of 635 companies that were required to produce the 1956 cents-per-message average schedules represented an outlay of approximately $104,000. This figure does not recognize items included in the general office budget or the time of the various companies in making the required studies. It would seem to be a reasonable investment when it is realized that the results of this study increased settlements approximately 12 million dollars on an annual basis.

And, now let's sum up the facts. As businessmen, you know that when you are dealing with agreements representing hundreds of millions of dollars, you cannot live in a world of fancy or conjecture. You deal with facts. Facts that support the retention by your company of a large part of the revenues that your subscribers' toll usage produces; revenue that means your financial well-being, in fact, over 27 per cent of your revenues last year. Revenues that were produced by settlement schedules used by thousands of our companies; schedules that are founded on detailed studies by over 60 of our companies; procedures for these studies that also may be used by companies which desire to make a special study to determine the adequacy of their toll settlements.

As the number of dollars involved in providing service interchanged with the Bell System grows, the requirements for study and facts increase in proportion. The association's toll committee and sub-committees are able, ready and willing to give their time and effort to the broad task of settlements, but the success of their efforts is dependent to a large extent on you. It cannot be a case of "let the other fellow do it" because if each had this philosophy nothing would be accomplished. As toll engineer, I accumulate the facts and make the studies and analyses required by the toll committees to represent you properly industrywide. It is my duty to obtain and study information and data as to the experience of our companies in toll settlements—experience that loses its identity in statistics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which in the aggregate are used by the toll committee when dealing with overall arrangements for settlements for the toll part of our business interchanged with Bell System companies.

Due to the limitations of time and staff, and in view of other equally, if not more important considerations, the toll engineer's activities must be confined to the broad subject of toll problems generally. For the reasons indicated we are not in a position to undertake studies for individual companies. However, we shall be happy to provide all of the help we can in response to requests for information and assistance from our companies on settlements problems.

I know that requests for studies and information add to the burden of the almost insurmountable work now facing our operating people. But, it is a task that cannot be ignored; not as long as we recognize the importance of receiving our fair share of these important revenues.

The toll committee and sub-committees and the toll engineer will be just as effective as you cause them to be. They are dependent on you for the ammunition they need to carry the ball. Give them that ammunition. Past history shows that the results will justify your efforts. My office, as one phase of your associations' activities, stands ready to serve you. Its effectiveness can only be measured by the use you make of it and the kind of a job that with your help it can do for you.

REA BORROWERS

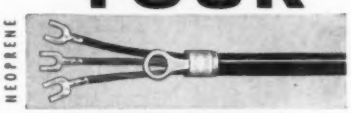
Continued from page 41

are shouldering the responsibility of full-fledged operating telephone systems. We also have mentioned the fact that rapid mechanization of the industry and the institution of nationwide toll dialing has been accompanied by important changes in thinking, relative to extended area service and toll line ownership. The entire gamut of connecting company relationships with the associated Bell companies is undergoing substantial modification. Some of these changes have been overdue for some time and others are yet to come.

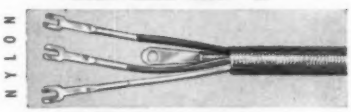
General recognition that toll line ownership is a prerogative and a responsibility of the Independent company within its service territory; the appreciation that extended area service is a mutually beneficial function within a community of interest and should be provided on a 50-50 basis by the participating companies; the freedom to provide your own directories and access to advertising revenues without restriction; and the recogni-

CORDS BY Runzel

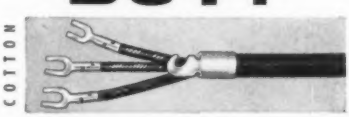
YOUR



BEST



BUY!



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tion that Independent companies, generally, should have an equitable share of the toll revenues generated and handled by them, are important segments of the changing scene that characterize our combined efforts.

Industry Cooperation

The job of rural telephony is an industry undertaking. Each of your companies is playing an important part, but the over-all success of our combined efforts will depend on the continuing cooperation and assistance of the larger Independent and Bell companies.

As Independents, you should look forward to, and assume the responsibility for merging and consolidating smaller units into more adequate and efficient operating systems. This must be done, however, without "bidding-up" acquisition prices and without excessive costs of any type. We should do everything in our power to discourage the efforts of some to inflate the value of rural telephone property far beyond its ability to produce.

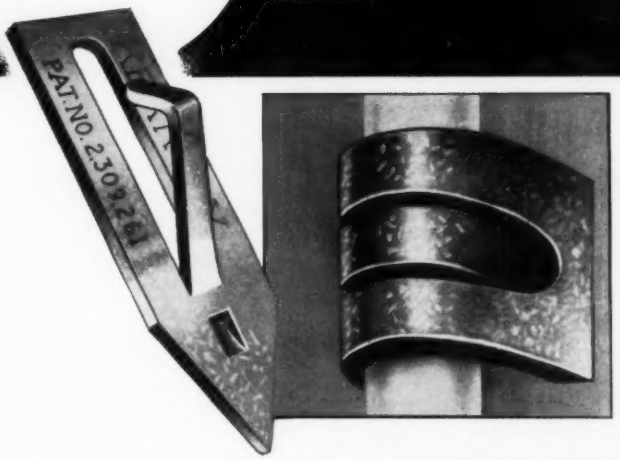
Our efforts should continue to be directed toward the complete and full integration of rural and urban telephone systems. In some cases, it has been necessary for REA borrowers to assume the responsibility for the rural areas surrounding towns owned by other companies. The result has been the creation of more costly telephone service and it is our hope that this can be avoided to a maximum extent. If the companies owning such towns are not willing and able to serve the surrounding rural portions of the communities of interest, they should be willing to sell or exchange such properties with companies that are willing to do the entire job. In many cases, this would result in increasing the efficiency of the selling company and enable the buying company to serve entire communities at lower costs and with more satisfactory service in every respect.

By working together in this fashion, it should be possible to carry out the policy set forth by the Congress in establishing the rural telephone financing program wherein it requires the administrator to make loans in a manner that would result in furnishing and improving telephone service to the widest practicable number of rural users.

In closing, I would like to express my personal appreciation, and the appreciation of my associates for the cooperation that we continue to receive from all of you, from the Bell companies, from the industry associations, regulatory bodies, suppliers, and all segments of the communications industry.

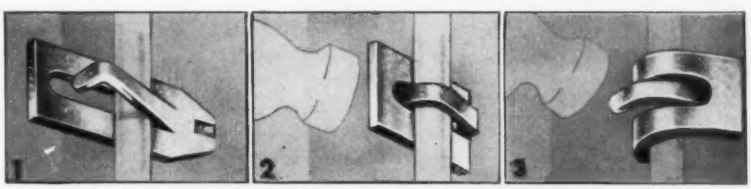
eliminates radio interference

KEARNEY NON-STATIC GROUND WIRE CLIP



When ordinary staples lose their hold in wood, contact pressure drops, and resultant air-gap static causes radio and television interference. KEARNEY Non-Static Ground Wire Clips prevent this interference by maintaining permanent, high pressure contact with ground wires, entirely independent of how tightly the clip is set in the pole.

When this clip is driven, a hook automatically, permanently grips the wire, remaining free of all trouble-causing air gaps. Inexpensive and easy to drive, this clip holds fast in all woods.



Easy to install: Just drive clip until point seats firmly in wood. Insert ground wire under hook, then drive until hook grips wire and starts protruding through slot in body. Bend end of clip over the wire and into the wood.

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RURAL TELEPHONE MARKET

Continued from page 38

In addition, the expected size of the loan funds required in the future suggests that REA borrowers begin to search for an additional source of capital. At the very least, they should begin to discuss the question. There are few businesses of any size today that find it wise or prudent to rely wholly on a single source of financing. I make these observations in the firm conviction that they are good for rural telephony.

For my part, I can assure you that REA will continue to meet all legitimate requests for loan funds while I am administrator. I will continue to administer the Rural Electrification Act as it is written, and to carry out the intent of Congress.

Both REA programs always have enjoyed strong Congressional support. They have received the enthusiastic support of millions of rural people, who have benefited directly by acquiring the same quality of automatic telephone service and electric service enjoyed by their neighbors in the city. And each year, there is wider acceptance of REA's telephone program by the industry at large.

One of the secrets of this wide support and acceptance, I think, is that we have tried to administer the telephone loan program in line with the needs of the borrowers themselves. We have tried to make our relations with borrowers truly a two-way street.

For example, we rely heavily on the advice and guidance of a telephone advisory committee, comprised of borrowers, industry representatives, and a representative of this association. The REA staff meets with this group twice a year, and I can tell you that it is more than a sounding board for the administrator of REA.

We work closely with our borrowers and with manufacturers in the development of new equipment and techniques designed to help telephone systems reduce the cost of outside plant construction and maintenance, and at the same time, help them to provide and maintain adequate service in rural areas.

During the recent years, these en-

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gineering advances have included adoption of specifications for fully color-coded aerial cable, the development of new wire and cable designs which have made buried plant feasible, and the development of insulated wire plant for long-span construction.

In the technical training field, REA has been working closely with its borrowers and their consultants. Recently, we have held workshop sessions on sales, budget, personnel, and management activities. We have held seminars for borrowers' personnel and consulting engineers on a wide variety of subjects, including buried plant, central office specifications, numbering systems, and new developments in microwave and carrier. Newest of all, we have held a series of CPA symposiums to acquaint public accountants with audit requirements of REA telephone borrowers. The fact that our telephone borrowers ask for this type of activity proves to me that the industry has vigor and a strong sense of community responsibility.

REA is happy to be associated with this vital growing industry of yours. I hope that you will let us help you where we can in achieving your commendable goal of meeting the telephone needs of rural people.

TOLL TICKETING

Continued from page 46

(3) Originating central office code.

(4) Settlement code.

The file is then processed by an electronic calculating punch. The calculator reads the rates from the master card, stores them, and by reading the class of call and the elapsed time from each mark-sensed toll card, rates that individual card. The terminating point or place called, together with the originating central office and the settlement code are simply gang punched from card to card. As the above step is completed, the master cards are sorted from the file. Next, the collect, third party, and other miscellaneous calls are removed and sent to an interpreter.

Summary cards to be used in the preparation of the interline report are prepared at this point. The cards are sorted by the previously mentioned settlement code, then tabbed and a summary card produced to carry forward this information to the interline date.

The collect and third number calls are now analyzed and the complete card sent to the companies using mark-sensing equipment or cut in size to that of a 1A ticket for companies using other

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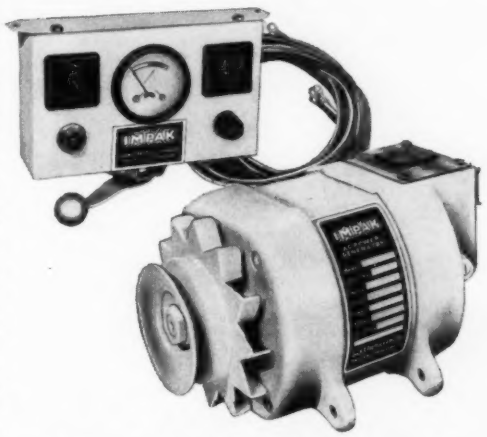
Cook "IMPAK" Generators

FOR 60 CYCLE 110v-220 VOLT AC POWER
WHEN AND WHERE YOU NEED IT



This complete line of mobile generators with a size for every requirement provides "power at the pole." With dash mounting control panel for your truck, this high output 60 cycle AC generator will supply electric power for such portable and fixed equipment as: chain saws, drills, electric hoists, air compressors, flood lights — any portable electric tool. Available in wattages of 1,000, 2,200 and 3,500 for 60 cycle single phase AC power. Up to a 5,000 watt rating is available in a three phase, 60 cycle generator. Output voltage of 115-240 volts are available.

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PROTECTED AND
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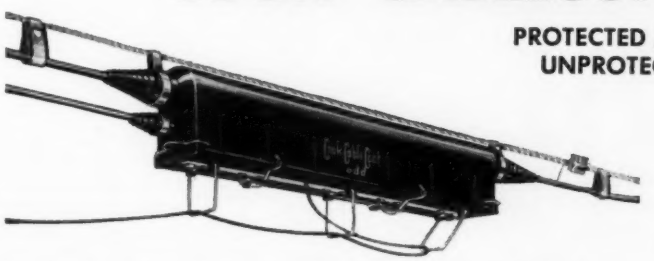

Terminal blocks in this neoprene splice cover can be provided — protected or unprotected. Selective pair protection is also available with either the Cook Minigap or Mytigap arresters. Protected terminals available in 6, 12, & 16 pr. sizes; Unprotected in 6, 12, 14, 16, 18, & 26 pr. sizes. Can be open and reached without damage at any time.

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DROP
or
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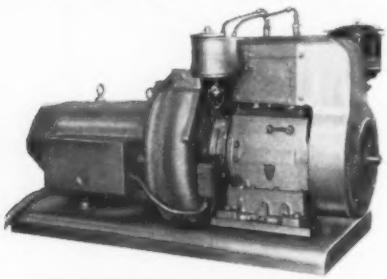

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ACTS...

. . . automatically to guarantee absolutely uninterrupted power. Not one precious second lost in load transfers.

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UNITED STATES
MOTORS CORPORATION
102 W. FIFTH AVE. OSHKOSH, WISCONSIN

billing procedures and processed as before.

The entire file is now sorted by telephone number and collated with the cards previously accumulated.

I am sure you are aware that the Bell System has conducted trial installations at Woonsocket, R. I., and Pottstown, Pa. We are advised that these trials have been most successful and the Bell System is proceeding to the conversion to mark-sensing which they expect to have completed by the end of 1960, with major metropolitan areas completed by the end of 1959.

Several larger Independent companies are also installing mark-sensing programs to coordinate with tabulating equipment now in use. The general acceptance of tabulating equipment, and a trend by the industry to mark-sensing, requires a standardization of the toll ticket card to be prepared by the operator. The ticket is designed by using a regular 80-column tabulating card. Columns 1 to 29, inclusive, and 50 to 80, inclusive, are required to have identical use by all companies. Columns 30 to 49, inclusive, are left for each company to determine their individual requirements. The basic columns include the following data:

Columns	*Field Description*
1-4	Date
5-14	From place and state
15-24	Billing number
25-26	Minutes
27	Settlement
28	Type
29	Class
50-53	Terminating toll center or local tax for intrastate messages only
54-56	Terminating revenue accounting center
57-59	From central office-alphabetic
60-77	To place and state
74-76	To central office-alphabetic
77-80	Charge

The data in Columns 50 to 53 and 54 to 56 are not used by all Independent companies, but various Bell System companies do use this information. You will note we have not classified Columns 30 to 49, inclusive, but there is a recommended use now included in some of the experimental installations. It is obviously of importance to the industry that tickets sent to another company be standard with respect to size, punch field layout and the interpreting field layout.

The mark-sensed card can be furnished in its entirety to companies now using mark-sensed equipment, or the card can be trimmed to 1A ticket size which will include all the information required by any revenue billing center. It is suggested that Independent companies planning to introduce mark-sense ticketing consult with their connecting Independent or Bell company to assure coordination and attain such assistance as is needed.

YOU'RE SELLING—SO WHAT?

Continued from page 52

providing "the best possible service at the least possible cost."

In view of the importance that our sales program has in maintaining a favorable position in the market, it behooves us to place our individual sales efforts under the microscope and examine the various components to see how well we are meeting our responsibilities. To start with, let's ask ourselves a few basic questions:

Are you, as top management of the company, convinced that this actually constitutes one of your cardinal responsibilities to the public?

Do you have a sufficient amount of personal interest in the development of the program that you furnish to it your personal participation and the necessary direction that is required to insure its success?

Do you provide your program with enough qualified personnel, adequately trained and properly equipped to canvass your present and prospective customers on a systematic, well-directed basis?

Under your present sales program, are you able to effectively measure the results that are being realized and compare them to quotas and objectives that were established?

Through the efforts of your sales people, do you receive a "play-back" from your customers that tells you the strong points as well as the weak ones of the various products and services that you have to offer, that furnishes information concerning how the customer uses his service and how much value he places on the various products?

If, after careful consideration of these questions, you can honestly say that your program does provide them, then I feel you can justly claim that you are fulfilling your responsibilities in the field of sales, at least to the extent of providing the tools necessary to acquaint your subscribers with the many products and services that are available to further enhance the value of his basic telephone service.

The true measure of the success of any effort is to be found in its results. Let's take a look at the record to see if the results give any indication that we are realizing our sales objectives. It

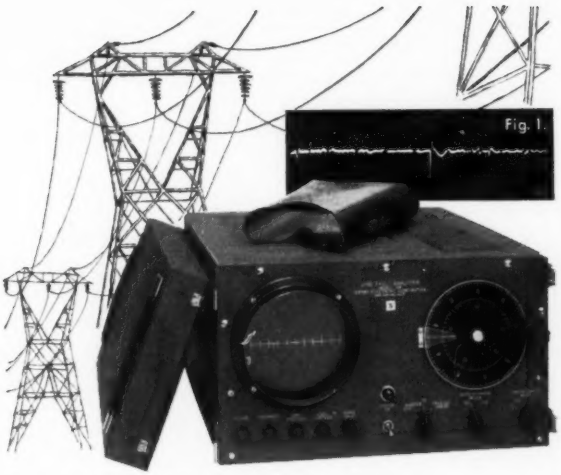

Figure 1. Display of 60 Kv line grounded at 27 miles.

Locate circuit faults exactly ...½ to 200 miles distant

Communication and power lines
Use on any open wire line
Direct reading, simple to use
Use at carrier terminal, powerhouse, sub-station

Shorts, grounds or opens up to 200 miles away can be located within a few yards with the improved Sierra 124A Line Fault Analyzer. The instrument, operating on radar principles, sends a high amplitude pulse along the line under test. Discontinuities, even capacitors and transformer banks, appear clearly; a complete picture of the line and its condition appears on the radar-type "A" scope.

Two Pulse Widths

To insure maximum readability, two pulses — a 1 microsecond, 1,000 volt pulse or an 8 microsecond, 500 volt pulse —are provided. Other features include a sweep delay, movable distance step, sweep repetition rate of 60 cps and a high intensity flat faced cathode ray tube. Provision is made for camera attachment to the scope face.

Bulletin gives details, actual utility operating experiences

Data subject to change without notice.

Sierra Electronic Corporation
A subsidiary of Philco Corporation
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Menlo Park, California, U.S.A.
Sales representatives in Major Cities
Canada: Atlas Instrument Corp., Ltd., Toronto, Montreal, Vancouver, Winnipeg
Export: Frazar & Hansen, Ltd., San Francisco, New York, Los Angeles

COOL PERFORMER

when the heat's on!

Despite temperature extremes, you can depend on Kennecott lead-alloy sheathed cable to give perfect service! Its exclusive "Young Process" lead sheath and precision-wound tape insulation shrugs off heat damage that would greatly shorten the life of other types of insulation and sheathing. Proof of this is that Kennecott Telephone Cable lines have been giving superior service since 1897. Get full details from the Chase sales office near you.

IT'S KENNECOTT TELEPHONE CABLE

INDEPENDENT

CHASE BRASS & COPPER CO., WATERBURY 20, CONN.
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Baltimore	Cleveland	Houston	Minneapolis	Philadelphia	San Francisco
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Charlotte	Denver	Kansas City, Mo.	New York	Providence	Waterbury
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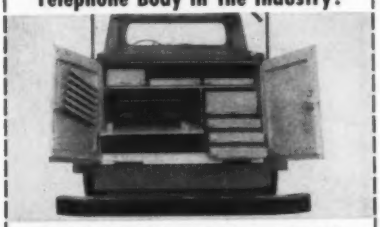
SERVES THE TELEPHONE INDUSTRY!

Stahl Side Boxes — convert pick-ups into efficient Service Trucks.

Stahl TMI-76 — Lowest-cost Telephone Body in the Industry!



Stahl TMI-76 — Engineered and built to rigid specifications.

Stahl Cable Splicer Body — built for longest, hardest SERVICE!

MAIL THIS COUPON TODAY FOR COMPLETE INFORMATION & PRICES!

Check product in which you are particularly interested.

Stahl Metal Products, Inc.

3490 West 140th St., Cleveland 11, Ohio

NAME_____

ADDRESS_____

CITY_____ STATE_____

has been my good fortune to have had an opportunity to review the results of various company's sales efforts, and in each instance they have been either comparing the revenue derived to the quota established, or the revenue derived to the cost of the promotion.

I question if we can properly determine whether or not we are meeting our basic responsibility to the public by looking at the revenue and expenses alone. Possibly we should look at the results in light of the number and kinds of items that have been sold and compare this to the items we have to offer for sale. With this type of analysis, we can more properly determine if we are exposing our customers to the full product line.

You might be surprised, for example, to learn that our full product line is in excess of 100 products and services. With this potential in our portfolio, I believe you will agree with me that our sales reports should carry a considerable variety. A detailed review of your sales results may show a very limited number of items reappearing month after month. If this should be the case, certainly it would warrant some further investigation and remedial measures to improve the product exposure.

All employes should be alerted to the profit potential and the additional value to the customers that each of the products and services represents. All of us have a natural inclination to devote the majority of our efforts on those things with which we are most familiar, and it is quite easy to slip into the habit of trying to interest the prospective purchaser in the few basic items with which we are most familiar and which in our opinion are what the customer really needs.

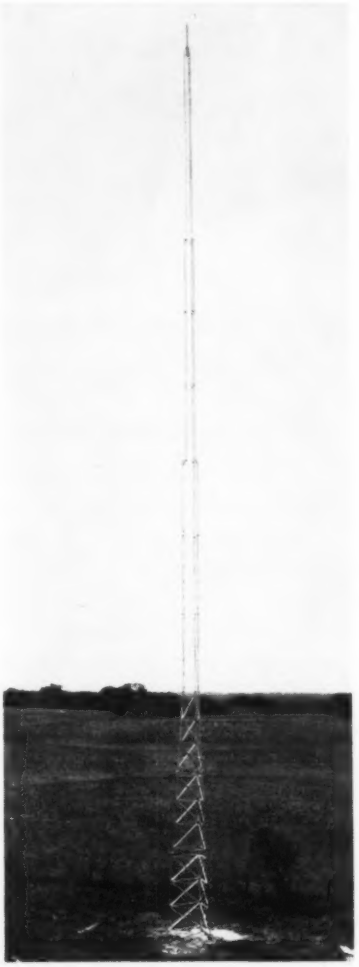
It will be time well spent if you will remind your employes that the majority of our products and services are sold on a monthly recurring basis and that some of the least expensive items to the customer generate continuing revenue for the company over the years, and add convenience and value to the customers' basic service.

There is a good possibility that a review of your sales results in light of the variety of items sold may result in some material changes in your sales approach. It may enable you to maintain better employe interest and enthusiasm, provide better service to your subscribers by furnishing more complete communications tailored to their individual requirements, and, at the same time, substantially increase your revenue and more adequately fulfill your responsibility to effectively merchandise your products.

New ROHN

SELF SUPPORTING

COMMUNICATION TOWER



★ 120 ft. in height, fully self-supporting!

★ Rated a true HEAVY-DUTY steel tower, suitable for communication purposes, such as radio, telephone, broadcasting, etc.

★ Complete hot-dipped galvanizing after fabrication.

★ Low in cost—does your job with BIG savings—yet has excellent construction and unexcelled design! Easily shipped and quickly installed.

FREE *details gladly sent on request. Representatives coast-to-coast.*

ROHN *Manufacturing Co.*

116 Limestone, Bellevue, Peoria, Illinois

"Pioneer Manufacturers of Towers of All Kinds"

Now that I have by "sheer accident" mentioned the term merchandising, I feel obligated to digress momentarily and analyze this suggested sales program to see if it is consistent with the objectives as well as the basic philosophy of a merchandising program. Merchandising, as you well know, includes many things in addition to promotion and sales. However, the end result and the only justification for a merchandising program is the realization of increased profits through increased sales.

Viewing in retrospect the suggested components for an active sales program, it becomes quite obvious that such a program will do much more than just sell. It will actually provide a number of the basic elements of a merchandising program, for it will contribute to good product planning, assist in establishing realistic pricing, provide current information concerning customer and employe attitudes, promote and sell our goods. With these elements incorporated in a sales effort, we can be assured of a substantial contribution from them toward the attainment of the objectives of an active merchandising program.

As far as we in the General Telephone System are concerned, I can best summarize our feelings toward our responsibility to actively sell all our goods and services by saying that to us the sales department isn't the whole company, but the whole company should be the sales department.

To realize the tremendous benefits that an active sales program offers, we are planning for each of our operating companies a sales organization, professionally trained, who will devote their full time and will be responsible solely for the systematic canvassing of all our present and prospective subscribers.

In addition, a small nucleus of specially trained sales personnel will coordinate the various programs on a system-wide basis, and will assist in the development and staging of special promotions on a recurring basis in the various companies in order to keep our subscribers better informed concerning the many items that are available that would add value to their present service. The cooperation of this sales group working with and assisting our regular employe sales effort will, we believe, insure the attainment of the maximum market potential in our operating areas at the earliest possible time.

It is my firm conviction that any company, regardless of its size and location, will as a result of inaugurating a properly planned sales program realize material improvement in their revenue, their public relations, their employe relations, their regulatory re-

NEW,

IMPROVED DESIGN!

Extended mounting slot now fits ALL standard 12" or 8" pin spacings . . . eliminates costly re-boring.

Case® ALUMINUM CROSS-ARM TRANSPOSITION BRACKETS.

Many new carrier circuit designs call for a reduction in wire spacing from 12" to 8". Normally this means thousands of new pin holes must be bored . . . an expensive and time-consuming job. Now . . . the new, improved Case cross-arm transposition bracket with the extended mounting slot fits all standard 12" or 8" pin spacings . . . eliminates the need for costly re-boring, and saves you thousands of dollars per year. If you are planning to re-space and transpose wires from 12" to 8" spacings, be sure to check first with Case.

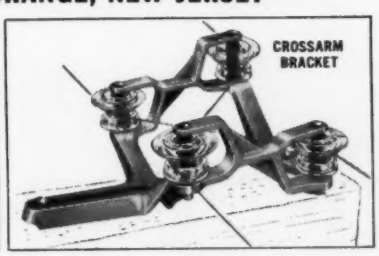
SOLD BY LEADING DISTRIBUTORS IN THE U. S.

CASE BRACKETS . . . STRONG, LONG-LASTING, ECONOMICAL, ESPECIALLY ADAPTED FOR CARRIER-CIRCUIT CONSTRUCTION

Write today for free illustrated brochure.

TRANSANDEAN ASSOCIATES, INC.

305 MAIN STREET, ORANGE, NEW JERSEY



NEW KLEIN
slitting tool
for all types of control cable

Patents 2398979
2691822

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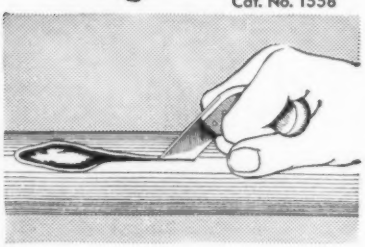

Here is a new tool developed by Klein, designed to slit insulation from flexible cords, PWC, telephone cable with vinyl or polyethylene jackets and bus drop.

Handle of cast aluminum, light in weight and with convenient grip; knife of tempered tool steel may be sharpened and is easily removed for replacement. This tool slits insulation from a few inches to as many feet as desired swiftly and simply. Does not damage conductors inside weatherproof sheath.

Write for bulletin giving complete information.

FREE POCKET TOOL GUIDE

A free copy of the new Klein Pocket Tool Guide will be sent on request without obligation.

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lations and their shareowner relations. The many benefits that accrue to the different segments of our business and the satisfaction that we are providing a more complete service to our customers is my answer to the doubting Thomas statement—"You're Selling—So What!"

VOICE IN THE DISTANCE

Concluded from page 68

number of calls whose transmission would be too high, would reach an unsatisfactory amount. . . . In determining proper via net loss, several considerations must be applied in the designs of intertoll trunks. The loss can be computed in intertoll trunk design by using the following equation: Via net loss equal to via net loss factor, times the length of link in miles, plus .4 db, plus the "b" factor.

It may be necessary to permanently connect facilities of many types in tandem to form a link. In such cases, the via net loss factor for each type of facility is multiplied by its length and the via net loss for the length is the sum of these products, plus .4 db, plus the "b" factor.

Those of you operating end offices (Class 5) will be mainly concerned with trunk terminations hooking into 900-ohm impedance (500-type subset) designed plant plus meeting the VNL (via net loss) + 2 requirement of your office trunk if owned by you. To those who operate Toll Centers (Class 4) or better offices will fall the greater burden, and there are several things, of course, that must be considered. There are certain equipment rearrangements and additions that are usually required. We quote from page 139 in the Pacific Telephone & Telegraph Co.'s report "A Survey of Telephone Transmission" in which these items are listed:

(1) "S" pads are removed from the intertoll trunk equipment.

(2) Primary centers (Class 3) and offices of higher rank requires an average office balance of 27 db (for the standard deviation of 3 db or less). Two-wire switching offices having a lower balance, usually require office balancing.

(3) Trunks to local offices having a 1,000-cycle facility loss of less than 2 db require a 2 db pad at the switching point.

(4) Loaded terminal lengths using H88 or loading of lower cut-off frequency having over 2 db 1,000-cycle loss, do not require pads, but must be equipped with impedance compensators.

(5) Non-loaded terminal lengths usually require 2 db pads regardless of facility loss.

(6) Terminal lengths operated on a carrier, and those equipped with hybrid type voice frequency repeaters, require no special treatment. (Lengths employing "E" type repeaters are treated as if they were non-repeatered).

(7) In trunk equipment using 120 type coils, the drop side blocking capacitor is made one microfarad to improve low frequency return loss.

(8) Operator telephone sets usually require a modification in the receiver circuit.

Now that we've discussed the via net loss plan briefly, let's go back for a moment to the plain, simple problem of providing our telephone customers increasingly improved service. Let us stick to just the transmission part of the service problem. As I stated before, the customer wants something better than he has now. As I also stated, it is fantastic what has happened to our industry since its birth and I guess most all of us are ready to recognize that anything can happen in the future, and certainly continued improvement must be forthcoming.

How do we do it? As far as we know at this time, there is no panacea, no short-cut, there is no bright light to point out to us a sure-fire transmission improvement plan to end all plans. But, there is a clarion call that we can all heed; this "voice in the distance" demands to be heard. Not by the strained ear in a quiet, tomb-like office, but it longs to be heard loud and clear despite the distraction noises, etc., and despite alternate routing. The problem itself can be stated simply without the use of superfluous platitudes.

We must assign our trunks, our local loops to make it possible for customers 3,000 miles apart to talk as naturally and as pleasantly as customers within the same town. We must provide talking paths with very small transmission losses that are rugged and cheap. Our telephone sets, our electronic devices, must be continually improved. If we use switching . . . we must not allow wide variations in transmission between alternate paths. In nationwide toll dialing, we have the dream of the future within our grasp. Via net loss will guarantee the consistency of quality, long sought by telephone people, and the "voice in the distance" once again will have the quality of the person at your elbow.

Cause Produces Effect

"I will not be as those who spend the day in complaining of headache, and the night in drinking the wine that gives the headache.—GOETHE.

PRESSURIZED CABLE SYSTEMS

The need for an automatic device to stand guard at intervals along pressurized cables has long been recognized. Now United Electric Controls has the answer . . . The Telephone Cable PRESSURE-GUARD.

Developed by U.E., in collaboration with the Bell System, the PRESSURE-GUARD is now available to all Telephone Companies as an aid in reducing cable maintenance costs.

In the past the location of a cable leak was a matter of man hours in climbing poles and manually checking pressure points. When the pressure guard detects a pressure drop it introduces an electrical resistance . . . which indicates at a central monitoring source a cable leak and the location.

Specifications Pressure-Guard

Field Adjustment Range	0 to 15 PSI
Factory Setting	2 ±¼ PSI on falling pressure
Pressure Response	4 ±½ oz.
Proof Pressure	30 PSI
Electric Rating	0.01 amp 110V DC
Load Resistor	Carbon composition 330,000 OHM 1 watt
Take-Off Tube	Tinned Copper 6′ x ¼″ x 0.035
Drop Wire	6′ Type SJ0 #18 stranded 0.2 conductor
Size	6″ x 4½″ x 2½″
Approximate Weight	1¾ lbs.

These specifications may be modified in a great variety of ways to meet the requirements of any given application.

UNITED ELECTRIC *manufactures a complete line of temperature, pressure, and vacuum controls. For applications requiring custom-built units or modified standard units, call upon a UE application engineer for recommendations. Write for complete specification and pricing data on the Telephone Cable Pressure-Guard. Similar data available on all other UE controls.*

United Electric Controls COMPANY
85 SCHOOL STREET, WATERTOWN, MASS.

what a line...

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You can't always pick the terrain over which service wires must be strung—but you can select guy and messenger wires that will hold lines in spite of high wind, snow and ice loading.

For long, trouble-free service, choose CF&I Galvanized Steel Strand. It is made of steel with exactly the right chemical and physical properties to assure high strength and easy workability. It is carefully drawn, cleaned and galvanized with a tightly-bonded coat of pure zinc to produce a corrosion-resistant finish that won't flake or peel, even when severely bent.

CF&I Galvanized Steel Strand meets or exceeds ASTM Specifications A-122 or A-363, or can be made in seven- or three-wire constructions to meet your specifications. Your nearby CF&I representative or local electrical distributor can give you complete details. Call him today.

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CF&I GALVANIZED STEEL STRAND
THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago Denver • Detroit • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

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Aerial Tents
Cable Benders
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Portable & Power Reels

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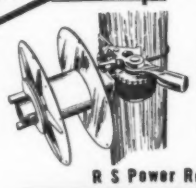
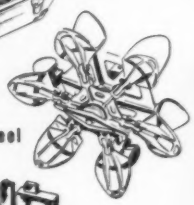
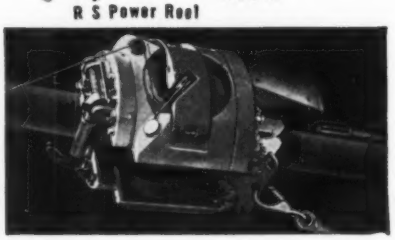
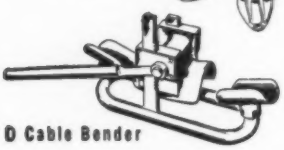

R S Power Reel


C R Power Reel




O Cable Bender

Distributed by Graybar

B, C, D, E & G Cable Lashers

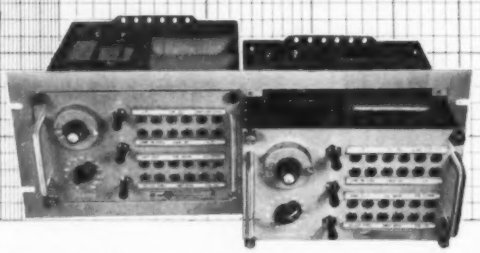
Special Purpose Tools To Specifications
Literature on Request

Over 500 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918

GMPCO

Cut line-up time from hours to minutes with Airtronics Packaged Program Equalizer



Now, a self-contained packaged program equalizer. Specifically designed for operation on standard program-loaded or non-loaded communications cables and open wire, but may be applied advantageously to a variety of other circuits.

The Airtronics Program Equalizer has pre-tuned circuits in 1½ KC steps from 5 KC to 25 KC. All adjustments made instantaneously by simple switch settings to desired frequency. Accurate equalization in minimum line-up time.

Using sweep generator techniques, equalizing costs go down, down, down. Airtronics Equalizer is available in portable, wall mounting, or standard 19" or 23" rack-mounting arrangements. Special purpose equalizers available on order. Write today for full details.

Another Airtronics Product for the Telephone Industry:
Portable Test Hybrid Set eliminates make-shifts, speeds acceptance tests on toll and interoffice trunks.

A PRODUCT OF
AIRTRONICS INTERNATIONAL CORPORATION
P. O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

ACCIDENT CONTROL

Continued from page 81

ACCIDENT

Now the fifth factor is the natural result of the first four factors. Any of these factors or a combination of them lead to the next factor, and that is the accident itself. Now this factor, in turn, may or may not result into the sixth factor—

INJURY OR DAMAGE

This is also known as the consequence. We can include deaths, fractures, abrasions, lacerations, etc., also smashed equipment, broken parts, etc. Therefore, accidental injury or damage is the natural result of a series of events which occur in a fixed and logical order. It is like a chain of sequences. This then is the vital clue to an effective accident prevention program—break or block the sequence.

Now then, as I said, our problem is to interrupt this chain reaction at some point before the accident occurs. I have also said that we must block it if possible. Now, these are the barriers that are used in a truly effective accident prevention program. Now let's take the first factor. What is the barrier here? It is the—

PROPER SELECTION

The first opportunity for this is at the time of the employment interview and then the pre-employment physical examination. The employment interview will determine the applicant's qualifications for the job and the doctor's examination will determine the employe's physical and mental fitness. After the worker is hired, it is up to the foreman or supervisor to exercise careful judgment in his selection of men for the work he assigns them to perform.

PROPER ATTITUDE

Now then, let's examine the behavior factor. Here we will erect the barrier of the proper attitude towards safety. We must understand and appreciate that safety does not come about as a secondary reaction to something else. Safety is of prime importance on any job, and it must be planned for on all jobs, both large and small, both routine and special. Now, proper indoctrination or training courses are of prime importance in breaking the new worker in properly "safety-wise." His first impressions are lasting, and they should reflect the best that the company has to offer from an accident prevention viewpoint.

REPORTING OF UNSAFE CONDITIONS

Say mister, is this pole gonna be here from now on?

Maybe not from now on, but it will last for years and years. That is unless it's struck by lightning or something. This is a T-C pressure treated pole. T-C's pressure treatment makes 'em last. Our company uses T-C poles all the time. We found they last . . . almost from now on.

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SPARTANBURG, SOUTH CAROLINA
PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

MAXIMUM SECURITY at

THE FORD MOTOR COMPANY
with TELKEE, *the Modern System of positive Key Control*

At Ford's new Sharonville, Ohio plant—and at dozens of other Ford plants across the country—TELKEE Systems assure constant, fool-proof control over the keys to every lock. TELKEE keeps keys in authorized hands; eliminates problems of lost keys; cuts costs of replacement locks and keys.

Available in capacities from 21 to 2240 key changes, there's a TELKEE System to fit your plant, building or office. Write today for "The Key To The Whole Thing".

P. O. MOORE, INC.
A Subsidiary of SUNROC Corporation
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DIG FAST!

SHAWNEE
"88" BACKHOE and SPECIAL Heavy Duty LOADER

Economy Priced!

Today's fastest backhoe. Digs 12' deep, dumps at 9'9", swings 188°. This hard-working tool reduces costs, requires minimum maintenance — it is versatile and moves easily from location to location. Built by the pioneer of the hydraulic backhoe.

Send for specifications and prices.

Loader Attachments:
Various sizes Utility and Material Buckets, Snow Bucket, Angle Dozer Blade, Bulldozer Blade, Crane Hook, Fork Lift, and Street Broom.

Serving in many industries all over the world.
SHAWNEE MANUFACTURING CO., INC.
1947DB -N. Topeka Ave. • Topeka, Kansas

COMBINATION DUCT SYSTEM HAS SEPARATE COVERS

Tele-Power Duct Systems have separate covers for these two important reasons: 1. The telephone installer or electrical contractor needs to install or remove only the cover for the wiring that concerns him. 2. The high and low potential wiring cannot be exposed to each other.

Send for new folder.

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PRESSURIZE YOUR TOLL, TRUNK AND SUBSCRIBER CABLE WITH DRY AIR, THE MOST ECONOMICAL GAS AVAILABLE

THE PUREGAS REFRIGERATOR COMPRESSOR AIR DRYER IS A FULLY AUTOMATIC, DEPENDABLE LOW COST SOURCE OF DRY AIR FOR MAINTAINING CABLES UNDER PRESSURE.

UTILIZES COMPRESSION, REFRIGERATION AND EXPANSION PRINCIPLES TO REDUCE THE RELATIVE HUMIDITY OF AMBIENT AIR FROM 100% AT HIGH TEMPERATURES TO APPROXIMATELY 2% AT 70° F.

THIS SYSTEM OF DRYING MAKES POSSIBLE A RELIABLE, MAINTENANCE FREE AIR DRYER WHICH IS MORE ECONOMICAL THAN NITROGEN FOR CONTINUOUS FEED PRESSURIZING OF AERIAL AND UNDERGROUND CABLE SYSTEMS.

Features Include:

- ADJUSTABLE HIGH AND LOW PRESSURE ALARM
- HUMIDITY ALARM—FAIL SAFE TYPE
- QUALITY COMPONENTS
- BAKED ENAMELED CABINET

22" Wide by 15" Deep by 39" High

For Complete details write to:

P E C INC.

PUREGAS EQUIPMENT CORPORATION
578 OAK STREET, COPIAGUE, L. I., NEW YORK

Unsafe conditions is the next factor. Here we will erect a barrier of prompt reporting of unsafe conditions so that corrective action can be taken. This is tied in very closely with the previous barrier. If a worker is given proper orientation, he will accept the reporting of unsafe conditions as one of the basic responsibilities to his fellow worker. He should make the reporting of unsafe conditions a part of his job and should always be on the alert for them and report them promptly so that corrective measures can be taken.

SAFE WORK HABITS

Now this next factor, as I have indicated, is the cause of 88 per cent of all accidents occurring in industry—the unsafe action of the worker. The barrier that we put up here is called safe work habits. Here again, this ties in with THE PREVIOUS TWO BARRIERS. Of course, safe work procedures are established by the company, and it is up to the supervisor to see that each individual worker understands and accepts the proper work procedures and that the worker himself acquires safe work habits. He should definitely get into the habit of working safely. This good work habit will carry him through even under circumstances when for some reason or other he is not quite up to par. Don't take chances; follow safety rules; don't short-cut; don't be a chance-taker. A chance-taker is a fool. When you take a chance, what do you gain?—A few minutes, a little effort? But, what do you risk?—Your life!

PROTECTIVE EQUIPMENT

In certain jobs in spite of what we do, we cannot completely eliminate the hazard so that we must plan to control the hazard and reduce the exposure. For example, we know that in the operation of a grinder, or drilling in concrete and in other similar operations, particles will fly so we wear eye protection to protect our eyes. We erect barriers and take other steps to protect those in the immediate vicinity. In instances where electrical circuits must be worked live, we use rubber gloves and other rubber protective equipment. Now if an accident does occur when we are working under these conditions, we will entirely eliminate the injury or at least reduce the degree of injury.

FIRST AID

The final barrier is first aid. If an injury is suffered, we can almost always prevent more serious results by prompt first aid and medical treatment, but I would like to stress here that first aid courses taught properly can actually strengthen the barriers established earlier of proper attitude and safe work habits.

Accident prevention can now be portrayed as a science and as a work that deals with facts and natural phenomena. It is a problem that may be solved by the same kind of reasoning that is successfully applied to many other problems concerning which there seems to be a better general understanding. As in mathematics, there are theorems in accident occurrence, for example:

1. A personal injury occurs only as a result of an accident.

2. An accident occurs only as a result of an unsafe act or an unsafe condition.

3. The unsafe act is committed or the unsafe condition exists because of the fault of persons.

4. The fault of persons is acquired through their environment or are inherent.

Accident prevention is just that simple and logical. The problem is getting all employes to understand and accept what has been presented here. It can be done if each individual understands and is sold on what you as a supervisor are trying to accomplish.

NEW METHODS

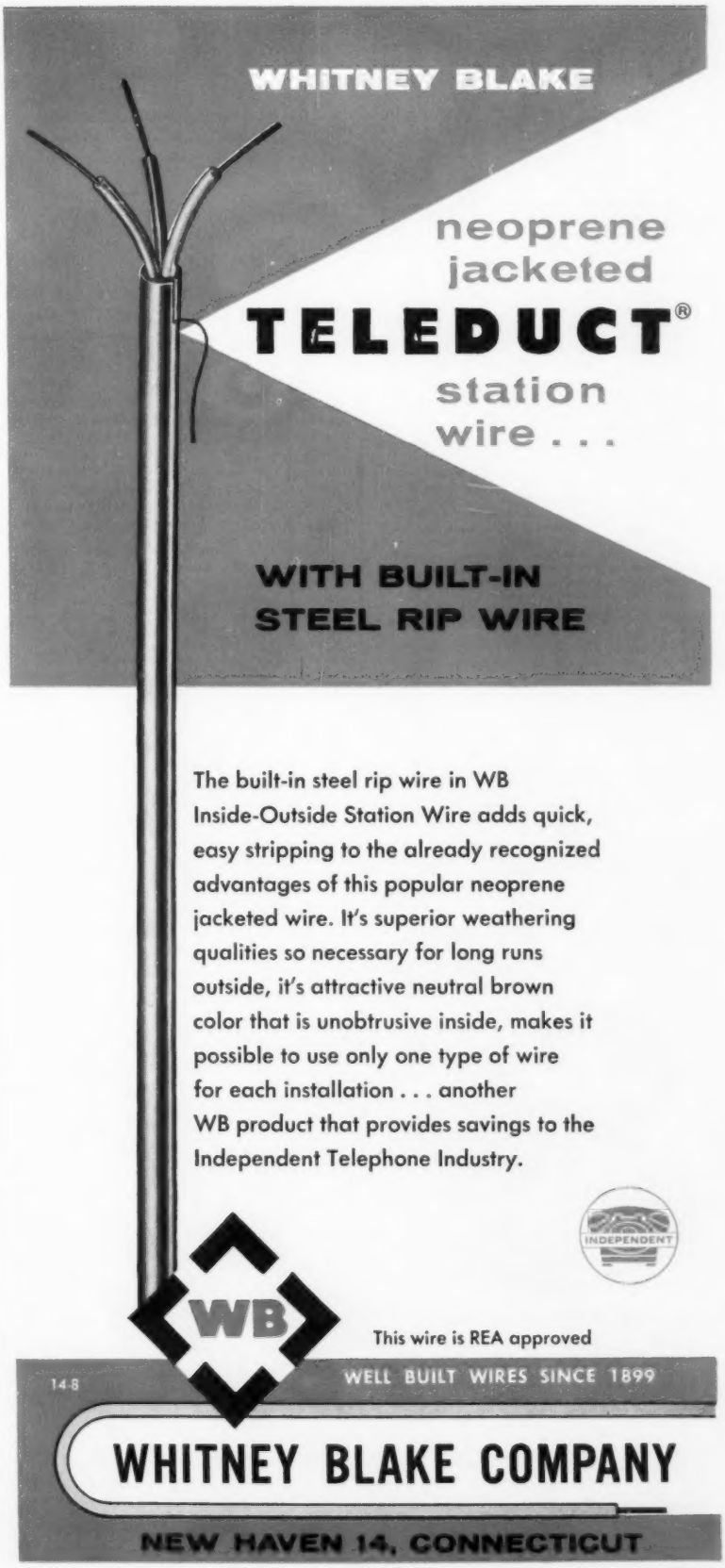
Continued from page 84

ard methods obsolete. An awareness of new methods and a knowledge of new equipment as it is made available can result in operating economies.

Along with the many new methods used in plant construction, economies can be realized in the field of carrier systems. More and more pole mounted rural and subscriber carrier systems are seen each day. The savings in plant construction is undoubtedly familiar to everyone.

This year has seen the introduction of concentrator units in outside plants. These pole mounted units have been proven in Europe and are now being developed in this country. Units are arranged so that 21 lines can be handled by five trunks or 42 lines by ten trunks. This arrangement lends itself to the saving of many cable pairs between the central office and the concentrator location. Units have been developed with built-in power supplies requiring very small drains.

As new methods are devised and used, the associated problem of training personnel in their use cannot be overlooked. As new devices are used the expected cost reductions cannot be obtained unless personnel has been properly trained in the use of these methods. The best method in the world is doomed to failure if the people who are to use it are not made thoroughly familiar with "What" they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are doing, "Why" they are doing it and "How" they are to do it. This can only be accomplished by the use of proper training techniques.

Training techniques are available today for any company regardless of size. These techniques range from the simplest to the most elaborate. If a method is developed which saves costs and results in more efficient operations, it deserves to be presented with the latest and best training techniques. One will then be assured of the best results in the utilization of the method.

MARK SENSE TOLL TICKETING

Concluded from page 102

the mark sense process to toll tickets necessitates some change in the toll board equipment with which the operator works.

(1) Ticket slots (associated with keys) need to be extended or replaced with a new slot of sufficient length to accommodate the longer mark sense ticket. It is estimated that proper size slots could be obtained at $4.40 per pair —for a position with eight cords the cost would be approximately $17.60.

(2) The Type 33 Calculagraph must have the left handle offset to clear the wider mark sense ticket. Recent estimates indicate the factory cost for this modification would be approximately $14.40 per clock plus handling charges.

(3) Ticket storage boxes in the face of the board would need to be modified or new boxes provided of sufficient width to accept the wider mark sense card. It is estimated that replacement boxes would cost about $8.00 each with approximately a $2.50 installation charge for each.

(4) While traffic is not involved with drawings and specifications it is of interest to note that approximately $2.00 per position would be expended in bringing these up to date to reflect the above changes.

The larger and heavier mark sense ticket presents problems as to how to get them from traffic to accounting without damages. The best method found to date seems to be a special carrying case similar to a laundry mailing case. The question of mailing *vs.* bus or other transportation is one that will need to be decided in each exchange depending on volume, distance to accounting center, etc.

Industry trials of mark-sensing to date have reflected no savings in traffic; in fact, traffic costs may be somewhat higher until the operators develop proficiency in mark-sensing techniques. The Bell System trials indicated, however, that a company savings can be realized.

It would be foolhardy to say carte blanche that the mark sense process will produce a savings for all companies and for this reason each company should make complete cost studies before deciding whether to change from their current operation. I am sure that the USITA Committee on Mark-Sensing and the connecting Independent or Bell companies will be happy to assist any company in completing a cost analysis on which to base their decision; if a definite savings cannot be shown, adoption of mark sense processes would seem questionable.

The data which has been presented was, in the main, developed from the limited industry experience which covers a relatively short period. The 1958-59 trial runs planned by the Bell System and several larger Independents should develop more information and/or confirm findings to date thus assisting the industry in determining the economic feasibility of adopting this new practice.

EFFECT OF DDD ON TRAFFIC

Continued from page 112

hesitancy in providing sufficient positions to meet these peak traffic periods.

The method used to provide these positions in the Warren toll office, does, I think, provide a most satisfactory and economical arrangement. It enables the operating room management personnel to maintain a balance between assignments for Direct Distance Dialing operation and operator handled traffic.

Ten of the regular outward toll positions were slightly modified for DDD operation.

The installation of this equipment on the positions in no way impaired their usefulness as a regular toll position. The normal operating arrangement is for the completion of regular toll traffic. They are only in the condition for answering Direct Distance Dialing calls during the interval from the time the "Access" key is operated and the "keying-up" of the last digit, of the seven digits of the calling customer's telephone number, about four seconds.

As not more than three operators, up to this time, have been required to satisfactorily care for the Direct Distance Dialing traffic, it will be readily appreciated that there are not only sufficient positions for growth but to

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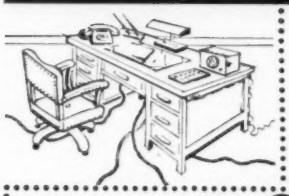

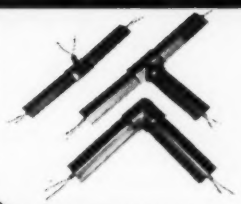

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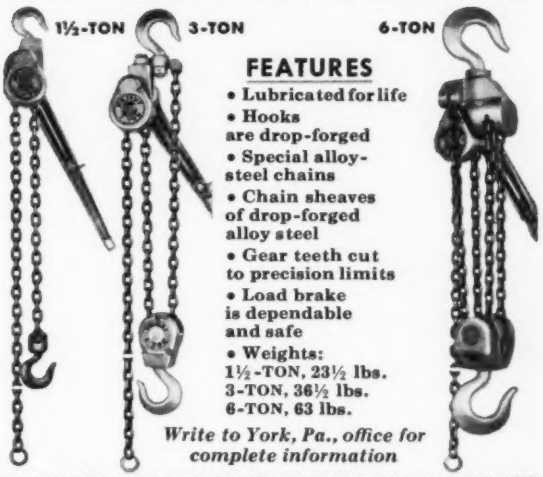

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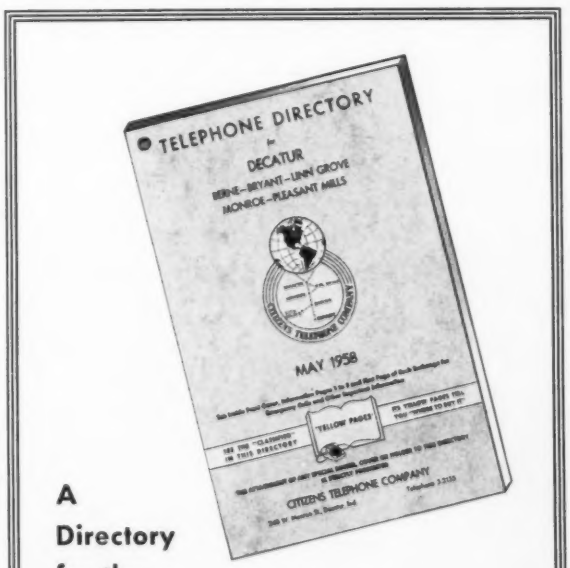

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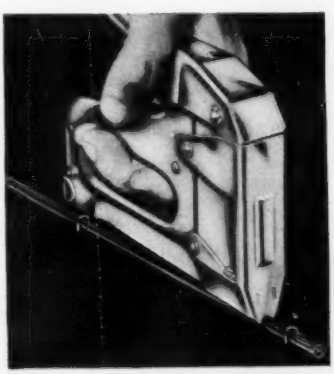

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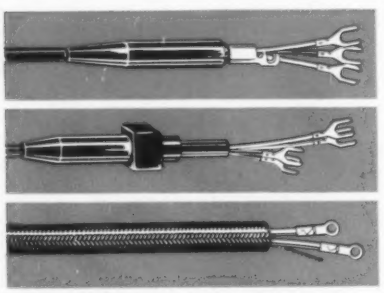

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care for any unusual peak periods for some time to come.

There are two lamps, one white and one red, mounted on a standard located on top of the switchboard midway between the 10 positions. These lamps enable the chief operator and her assistants to maintain constant supervision as to the promptness with which the trunk signals are being answered and the adequacy of the operator trunks between the Direct Distance Dialing system and the positions.

The white lamp is a multiple of the trunk lamp on the positions. When this signal is flickering "on" and "off" the supervisory staff is assured that an adequate number of positions are assigned for this purpose and that the signals are being promptly answered. If this lamp should remain steadily lighted it indicates that additional operators are required.

The red lamp provides a visual signal when all operator trunks are in use and customers attempting to place calls through the Direct Distance Dialing system are being delayed in passing their station number to the operator. Any time this lamp should light, the chief operator or her assistants will call the chief switchman immediately. If no trouble is found, the chief switchman will advise the traffic engineer, whose duty it will be to determine if additional trunks are required.

Access to Dialable Points

While it is most important to provide sufficient DDD equipment to have adequate trunking and a liberal force to answer the customers' Direct Distance Dialing signals, they will, of themselves, produce no savings.

These savings will materialize only when operator handled traffic is converted to customer dialed traffic.

While practically all possible short-haul customer dialable traffic will automatically convert to customer dialing, it is essential, if maximum traffic savings, as well as compensation payments received under the traffic agreement, are to be maintained as near as possible at their prior level, that all possible long-haul traffic which can, without violating authorized routing instructions, be authorized for customer dialing.

This authorization should be done only by someone who is familiar with both routing and nationwide dialing procedures.

Records

You may be interested in some of the records being maintained by Warren Telephone Co. traffic engineers to keep management and operating room personnel advised of the performance and operation of the Warren DDD system.

Peg count and "all trunk busy" meters have been installed to record the performance of all essential units of the DDD System. These include ticketer attempts, operator attempts, tabulator attempts, ATB's on transenders, access code trunks, circuit groups and other miscellaneous units. These meters are read each day, at midnight, except during the two peg count days each month, when they are also read each hour from 8 a.m. to 5 p.m. to obtain "busy hour" data.

Basic information, as shown in *Table 1*, is compiled as early as possible each day and entered on forms available to management and operating room personnel to advise them as to the daily performance, not only of the DDD system, but the operator-handled traffic as well.

At the end of the week the data in *Table 1* is typed as shown on *Table 2* and copies are furnished the management and operating room personnel. This data is also platted daily on a graph.

This data, together with certain other basic data, is for each business day of the month, and is entered on a special record in both daily and accumulative form. At the end of the month the average of each of these items is prepared as shown in *Table 3* and copies are forwarded to management and operating room personnel.

Various other records are kept by the traffic engineer to check the performance of the DDD system and to ensure that the customers of Warren Telephone Co. have access to all customer dialable points. These records include average business day messages for both customer dialed and operator handled traffic ticketer and operator attempts per customer dialed message, percentage of customer dialed messages of total messages, percentage of "busy hour" of total day for various items of traffic, and records of all points accessible for customer dialing.

If you now have a Direct Distance Dialing system in service and are not keeping records on basic items, I would recommend that you start as soon as possible. I would also recommend to the rest of you that as DDD systems are placed in service in your offices that you start compiling this information the day the system is placed in service.

Without this data you do not know where you have been, where you are, or where you are going.

Maintenance Cost, Savings

While maintenance costs or savings are not usually considered in a discussion of matters pertaining to traffic

operation, I would like to touch on them briefly as I know there are several in this group who are particularly interested in this phase of Direct Distance Dialing operation.

Not being familiar with any other DDD system, other than the one installed in Warren, I must, of necessity, confine my remarks to that particular system.

The DDD equipment was installed in a room provided for this particular apparatus. It is so laid out that it can be increased to more than double its present size without an addition to the building. If and when an addition to the building is made, each component part of the system—ticketers, transenders, perforators, etc.—can be added to and grow in a systematic and logical arrangement.

The system was installed and has been maintained without any increase in the maintenance force due to its installation. The alarm system of the DDD system is tied in with the alarm system of the local office.

Routine testing of the DDD system has been coordinated with that of the local system.

We believe, although we have no data to substantiate this belief, that the installation of this system in a separate room, without crowding, has been a material factor in the low maintenance cost.

Non-Billable Messages

Another question of high priority relates to the number of DDD messages which are returned from the billing department as unbillable due to either an error in the customer's number or no master rate card being available for the central office code dialed by the customer.

For a 69-day period, during July, August and September, a total of 298,029 messages were handled through the DDD system. Of these, the billing department reported 580, or .19 of 1 per cent as being non-billable. Expressed another way it represents one apparently unbillable message in each 514 DDD messages, an average of 8.4 per day.

The unbillable IBM cards, on which the message data is tabulated, are forwarded by the billing department to the chief switchman and the traffic engineer to determine, if possible, the cause of error and if correct billing information can be determined.

From these analyses, minor troubles in the DDD system have been cleared and it has been possible to return many of the IBM cards to the billing department for billing.

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It is my belief that if actual figures were available as to the number of messages returned for billing, the actual non-billable messages would not be greater than .15 of 1 per cent.

One of the principal causes of errors was due to the numbering system in effect. Prior to Sept. 21, the telephone numbers in five of the units having access to the DDD system had telephone numbers consisting of five numerals, while the numbers in the three other units consisted of two-letters and five numerals. As the calling customer's number had to consist of seven numerals to satisfy the DDD system, it was necessary for the DDD operators to "key-up" two zeros preceding each five-numeral number. As the majority of DDD calls came from customers in five-numeral offices, the DDD operator would, at times, "write up" the two "zeros" on a call from a two-letter-five-numeral unit and not be conscious of having done so. This arrangement also caused some confusion among the customers in giving the number of the telephone being used, as many had their homes in a five-numeral unit and their place of business in a two-letter-five-numeral unit, or the reverse.

This arrangement is no longer in effect as, on Sept. 21, all numbers in all units were changed to two-letters-five-numerals. Although no data has as yet been compiled to determine what improvement, if any, this has made in the number of errors in the calling customer's number, it is my belief that there will be considerable improvement in correcting this type of error.

One cause of messages to points in other areas being reported as non-billable is the conversion of a central office to two-letter five-numeral numbers without any information being available as to their possible conversion. As these conversions are not listed in "The Direct Distance Dialing Reference Guide," the billing department could not check them and the IBM message card was forwarded as being non-billable. In these cases, it was necessary to call the routing engineer of the Bell company to secure the necessary information to prepare a master rate card.

I believe that the performance, in Warren, as regards non-billable DDD messages is a very excellent one and speaks well of the performance of the DDD system and the DDD operators, and the Warren customers as well.

Let me say, in closing, that Warren Telephone Co. is more than pleased with the performance of its Direct Distance Dialing system and the reception accorded it by its customers.

COURTS AND COMMISSIONS

Concluded from page 118

Ness City and Hoisington (TELEPHONY, July 26). The company had asked for a $33,965 annual increase.

North Carolina Company Ordered to Serve 47

The Morris Telephone Co., Roxboro, on Oct. 15 was ordered by the North Carolina Utilities Commission to serve "without undue delay" 47 residents in Person County who had asked for Southern Bell Telephone & Telegraph service.

The residents wanted Southern Bell to provide service from its Reidsville exchange, but the commission ruled that Morris Telephone Co. was "morally and legally obligated" to provide the service.

The commission noted that the cost to Southern Bell would be excessive and that Morris Telephone had expressed a willingness to provide the service through its Yanceyville exchange. The commission found that Morris had obligated itself to serve the petitioners (the 47 residents) who reside within its service area, "and it is now its moral and legal duty to do so." It also noted that the Morris company has said it is prepared to get service to the area sometime in 1959 while it would be sometime in 1960 before Southern Bell could provide service.

Southern Bell at a hearing had contended it would not be feasible to serve the area through the Reidsville exchange, and the commission agreed, stating that the $3,400 the company would realize in revenue would hardly be enough to pay maintenance costs and ad valorem taxes. The petitioners had contended they are economically and socially closer to Reidsville than Yanceyville, but the commission said the mileage costs would be less through Yanceyville than Reidsville and it would be less expensive for Morris Telephone Co. to serve the area.

Ill. Independent Asks Raise

The Chesterfield-Medora Telephone Co., Chesterfield, has petitioned the Illinois Commerce Commission for an increase in rates, it was reported on Oct. 1. The raise would be effective for the company's Chesterfield, Medora, Hettick, Rockbridge and Piasa exchanges.

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Obituaries

JOHN O. TIDD, 58, district manager for the United Telephone Co. of Missouri at Maryville, Mo., died unexpectedly on Oct. 1 at Maryville. Mr. Tidd succumbed to a heart condition after a short, three-day illness.

He began his telephone career in 1920 at Lawrence, Kan., later purchasing and operating the Perry, Kan., exchange. From 1925 until 1929 he worked for the Southwestern Bell Telephone Co., resigning to join the United System at Odessa, Mo., as troubleman.

He held manager's responsibilities at Appleton City and Lebanon, Mo., and Siloam Springs, Ark., until 1945, when he purchased the Braymer, Mo., exchange. In 1947, he rejoined the United System, managing the Nodaway Telephone Co. at Maryville. In later years, he became district manager of the northwest portion of the United company's Missouri system at Maryville.

Mr. Tidd was a member of the Theodore Gary Chapter of the Independent Telephone Pioneer Association.

He is survived by his widow, a son, and two brothers.

•

GEORGE SHEETS, for the past eight years Washington representative of Stromberg-Carlson, a division of General Dynamics Corp., died on Oct. 11 in Washington after a long illness.

Mr. Sheets, a native of Findlay, O., was a veteran of World War I, in which he served in the Balloon Service of the U.S. Signal Corps. From 1919 to 1941 he was a manufacturers' representative in Pittsburgh, and later in New York City. During World War II, Mr. Sheets served as a civilian employe of the Navy Department in Washington. He joined Stromberg-Carlson in 1950.

Mr. Sheets in 1956-57 served as secretary of the Washington chapter of the Armed Forces Communications & Electronics Association, and at the time of his death was a member of that organization's board of governors.

He also held memberships in the American Ordnance Association, the Air Force Association, National Security Industrial Association, American Society of Naval Engineers, and the National Aviation Club.

He is survived by a step-daughter, Mrs. T. B. Koonce Jr., of Jacksonville, N. C., and a step-son, Fred Norman, of Guatemala City, Guatemala.

•

LOUIS DEROISY, 58, of Automatique Electrique, S.A., Antwerp, Belgium, died recently of a heart attack. A graduate of the University of Liege and of

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the Institut Montafiore, he had nearly 30 years' service with the Belgian affiliate of Automatic Electric International. For some years Mr. Deroisy was a sales engineer representing the company in Iran, Iraq, Syria and Turkey. At the time of his death he was in charge of engineering liaison with the Belgian Telephone Administration.

Tell Officers of N. C.-Va. Cooperative Association

The Carolina-Virginia Telephone Membership Association, Inc., Clinton, N. C., on Oct. 11 announced the following officers: President, L. A. Edwards of Clinton, N. C.; vice president, W. H. Hardy of Dobson, N. C.; secretary-treasurer, Thatcher Carr of Elizabethtown, N. C., and executive secretary, R. M. Holland of Roseboro, N. C.

Mr. Holland reports the association was incorporated under the laws of North Carolina on May 27, 1957, for the benefit of telephone cooperatives in North Carolina and Virginia. He further stated:

"The main objectives of the association are education of employes of the cooperatives in the two states and dissemination of information to subscribers of rural telephone service as well as the public-at-large.

"Also the association is working for better inter-connection contracts and for extended area service.

"In general, it is the parent association for all rural telephone cooperatives in the two states."

AT&T Asks FCC To Expand U.S.-Bahamas Overseas Link

Plans for an "over-the-horizon" radio system between the United States and the Bahamas were made known on Oct. 15 in an application filed by the Long Lines Department of American Telephone & Telegraph Co. with the Federal Communications Commission. The new system would supplement ten existing radio-telephone circuits now in service between the United States and the Bahamas.

According to an announcement by Long Lines, the company was requesting authority to use frequencies in the 2,110-2,200 megacycle band for the new system which is needed to handle expected growth.

Terminal facilities in the Bahamas would be owned and operated by the Telecommunications Department of the Bahamas Government while the U.S. terminal would be owned by Long Lines and located at Florida City, Fla.

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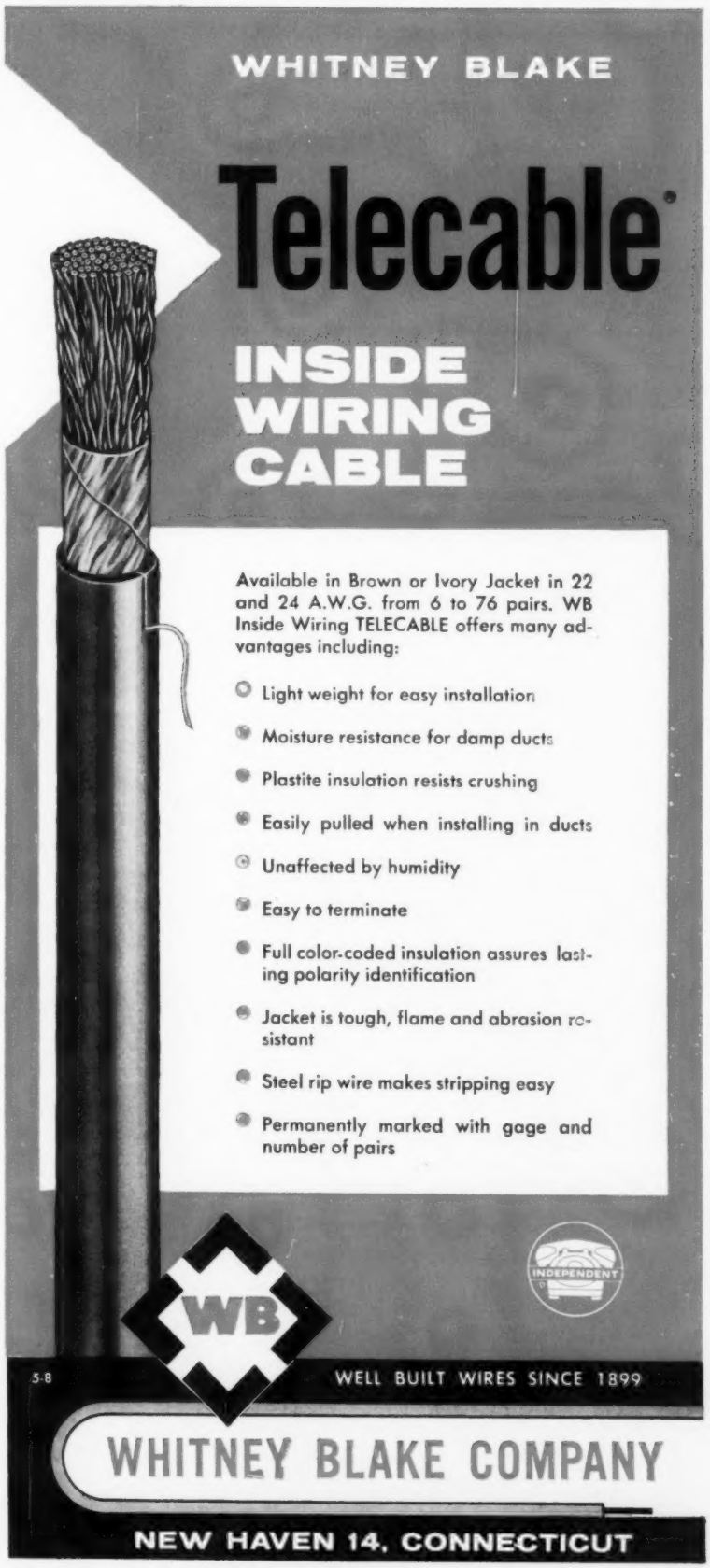
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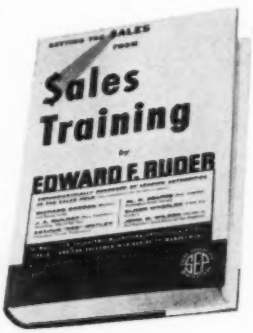

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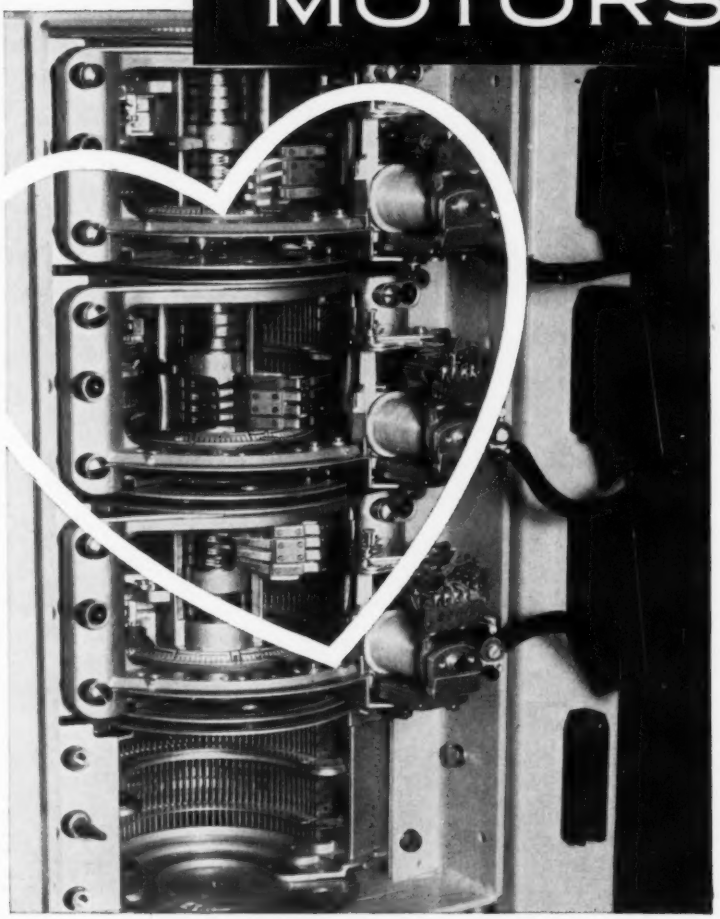

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